September/October 2006 >> Vol.27

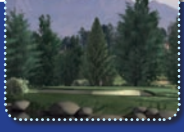
AEC MAGAZINE

DESIGN, MANAGEMENT & COLLABORATION IN THE BUILT ENVIRONMENT



Sustainable design

Autodesk keen to assist in a greener future



Bentley interview
Joe Croser on 3D MicroStation and beyond



Acrobat 8 Professional
Simplifying and accelerating the creation of PDFs



Power surge
Intel chips winning the race in new generation workstations

AECMAGAZINE
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Autodesk to acquire Robobat

Autodesk has signed a definitive agreement to acquire Robobat, the French structural engineering analysis, design and steel and concrete detailing software developer, for $33 million.

The acquisition looks like an interesting move for Autodesk, who recently announced V4 of Revit Structure, which offers round trip analysis to a number of structural analysis solutions including Robobat's Robot Millennium. However, in terms of overall penetration of this growing market, Autodesk will still be playing catch up with MicroStation developer, Bentley, who acquired both RAM International and Staad.Pro last year. In addtion to structural anaylsis software, Robobat also develops steel and concrete detailing software for AutoCAD.

"As we enhance our comprehensive solutions for structural engineering, Autodesk remains committed to supporting our customer's choice of structural analysis and detailing software," said Jay Bhatt, VP, Autodesk Building Solutions. "We will continue to support open data exchange standards and to work closely with our strategic structural engineering partners to support the many different ways that structural engineers around the world use software to work." ***www.autodesk.co.uk***

OS helps shape project to manage Britain's underground assets



A national project looking to increase the visualisation of underground assets via 3D mapping is being supported by geographic data and satellite navigation technology from Ordnance Survey as core components.

VISTA (Visualising integrated information on buried assets to reduce street works) is a collaboration of 21 organisations developing an integrated infrastructure to enable data sharing for all buried assets across Great Britain.

Ordnance Survey's intelligent large-scale data OS MasterMap Topography Layer is the reference base underpinning preliminary trials by researchers at Leeds and Nottingham Universities to integrate disparate records of buried pipes, cables, ducts and wires.

VISTA will combine this information with in-situ survey observations using real-time centimetre-level services provided by OS Net, Ordnance Survey's GPS correction network, and by Leica Geosystems' SmartNet, which is enabled by OS Net. OS Net is a network of more than 90 GPS base stations that is designed to improve the standard accuracy of raw GPS readings to augment any application that requires GPS positioning.

The national mapping agency's digital geographic information (GI) will reference this data to assets visible in the street to create a virtual 3D image of buried infrastructure. The information will be dynamically merged to give utilities and contractors instant 2D and 3D visualisations of the underground pipe and cable network via a portable device. This would enable more efficient scheduling of works to help minimise disruption and reduce their size and duration.

Utilities open up four million holes in the UK's streets each year at an estimated cost of £1bn, with indirect costs of £4bn due to traffic delays and damage to highways, for example. ***www.ordnancesurvey.co.uk***

New noise analysis tool uses Cadcorp SIS

Cadcorp's SIS (Spatial Information System) has been chosen as the basis of a new noise analysis mapping application.

Sold exclusively by Cadcorp business partner Geomod, MITHRA-SIG integrates the analysis engine of MITHRA with the 3D spatial modelling capabilities of Cadcorp SIS Map Modeller. It enables the user to calculate the noise footprint of an entire community from hundreds of thousands of surveyed points and then to use the 3D geospatial modelling capabilities of Cadcorp Map Modeller to graphically represent the results and to generate a 3D visualisation of the townscape or landscape under investigation. MITHRA-SIG is suitable for monitoring road, rail and industrial noise levels with a view to assessing the acoustic impact of future construction projects and for mapping noise from roads and railways. ***www.cadcorp.com***

Fabsec 'cuts design time' for steel framed buildings

FBEAM 2006, the latest design software from Fabsec, the UK supplier of long span cellular steel beams, gives structural engineers a new project capability which enables them to manage all the beams on a project collectively. The group analysis, optimise and edit function is designed to enable the rapid design and modification of multiple beams. Rationalisation of beam designs - to create better batch production for manufacture - is also possible.

The new version includes a two-way link to the RAM Structural System to accelerate the speed and time needed to complete frame analysis. FBEAM 2006 also introduces an innovative intumescent coating developed by Leigh's Paints that dramatically reduces the paint thickness required to achieve a fire resistance period of up to two hours. ***www.fabsec.co.uk***

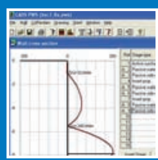
Inventor helps secure accommodation contract



Specialist furniture manufacture, InterFocus used Autodesk Inventor 3D design software on a major contact for a new student accommodation block at Cambridge University. Interfocus worked closely with Autodesk Manufacturing Solutions Provider, Micro Concepts.

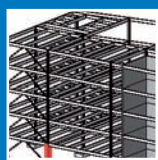
"The design called for some unique features, including a specialist seating layout for the kitchens," said Interfocus senior project manager, James Cannon. "By using Inventor's 3D visualisation capability, we were able to include highly professional and realistic representations of our proposed concepts, which undoubtedly helped us in securing the project." ***www.microconcepts.co.uk***

CADS releases Piled Wall Suite v4.17



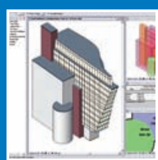
CADS has released v4.17 of its Piled Wall Suite, used for the analysis & design of sheet piles, king piles, contiguous bored piles, diaphragm walls and cofferdams. The software delivers a range of calcs, DWG and DXF files. v4.17 now includes CIRIA C517 pressure distribution for multi propped walls. ***www.cads.co.uk***

Revit Structure's analytical tools enhanced for V4



It's been just over a year since the first release, but Autodesk has already announced the availability of Revit Structure 4, the building information modeling (BIM) software for structural engineering, design and documentation. Revit Structure 4 introduces new advanced analytical tools and makes modelling key structural elements even more intuitive, the company claims. ***www.autodesk.co.uk***

UK architectural firms invest in Revit Series



London-based architectural practice, Levitt Bernstein, has invested in 22 seats of Autodesk AutoCAD Revit Series – Building. It is reported that the firm was just about to buy a different product when a last-minute demonstration of Revit Series by Autodesk reseller partner Cadassist convinced them to reconsider. Meanwhile, Hampshire-based architectural practice, Lyons Sleeman Hoare, has invested in 20 seats of Autodesk AutoCAD Revit Series – Building as part of a planned migration from 2D to 3D design. The team will continue to use both 2D and 3D where appropriate. ***www.autodesk.co.uk***

WWW.BENTLEY.COM/UK/BIM

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BlueSky to bring 3D maps to life



Aerial mapping company BlueSky has signed an exclusive agreement with Art Systems, the UK distributor of Contex 3D Printers to take computer generated 3D designs and automatically create physical models in full colour and to scale. Contex's software 'slices' the computer design into thousands of ultra fine layers. Each layer is then 'printed' by spreading a sub millimetre thin layer of composite powder onto a base. Subsequent layers are fixed together using a liquid binder.

"By signing this agreement we are making 3D printing as easy and accessible as 2D printing" said Rachel Eddy, Managing Director of BlueSky International. "We already have the expertise and experience of producing high quality digital geographic models by combining detailed aerial photography, highly accurate height data and the latest 3D software," she continued. "We can now finally replicate our digital capabilities with physical deliverables." ***www.bluesky-world.com***

CADline develops 'Part L' design solution

CADline is developing an integrated software solution which is designed to help the building industry meet tough new regulatory demands for greater energy efficiency in building design. The latest Building Regulations Part L, which came into effect in April 2006, is in part designed to cut carbon emissions by 20 per cent in dwellings and 27 per cent in other buildings compared to the previous 2002 Regulations. "This provides a real challenge for the building industry and will have a profound effect on the traditionally 'arms-length' relationship between architects and buildings services engineers," confirms David Payne, Product Manager, CADline.

"In future, under the new more stringent regulations, it will not be possible to use services to correct an inherently non-compliant design," he says. "As a result, architects and engineers will need to work closely together from the beginning of a project, to avoid the risk of months of design work being wasted, with potentially serious implications on building costs and penalties for late completion."

In response, CADline is combining its experience in both architectural design and building services automation software to develop a fully-integrated, end-to-end software solution. "In order for building professionals to communicate effectively, their respective design software tools must also be able to 'talk to each other', so taking both time and risk out of the design process," says David Payne.

In order to deliver this, CADline has already linked its Cymap building services design solution with Autodesk's ABS software and is well underway to creating a parallel link with Tas design simulation tools which check for Part L compliance.

"Our objective is to provide intelligent, two-way dataflow throughout the design process," he confirms, "removing the need to input data more than once, improving design accuracy and saving time and money."

"By communicating in this way, not only will it ensure essential compliance," concludes David Payne. "But it will also make their respective roles easier and deliver projects faster."

www.cadline.co.uk

VectorWorks 12.5 to run native on Intel-based Macs

Nemetschek North America has updated its entire line of VectorWorks products to version 12.5. Notable enhancements to VectorWorks 12.5 include support for Apple Macintosh OS X operating on the new Intel-based Macintosh, Adobe PDF import and export support (including batch export) and support for Google Earth's KML files. Overall speed and performance has also been improved.

"The big news for version 12.5 is that VectorWorks is now a universal application - it runs natively on both the Intel and Power PC-based Macintosh," says Paul Pharr, Nemetschek North America's chief technology officer. "In a word - it's fast. We've run speed trials that demonstrate 2D drawing, rendering, and 3D modelling operations are up to 12 times faster on a Mac Pro Quad Xeon 3.0 GHz, compared to a Power Mac Dual G4 500 MHz. Users on Windows and older Macs will see some important speed improvements, too. Opening and saving files on network servers is between five and 30 times faster with VectorWorks 12.5 depending on the file, and RenderWorks rendering is up to 40 percent faster. Finally, the ability to both import and export PDF files on Mac and Windows will open up interesting possibilities for VectorWorks offices to streamline their document workflow."

Other noteworthy improvements to VectorWorks 12.5 include unit matching and intelligent detection of Xrefs for smoother DXF/DWG imports, new and improved drafting tools to increase drafting efficiency, and support for High Dynamic Range Images (HDRI) in RenderWorks, which is designed to make the creation of realistically-rendered objects and exterior scenes easier.

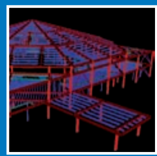
www.nemetschek.net/12.5
www.unlimited.com/3ddesign

Bentley announces call for presentations



Bentley is inviting its users to submit an application to present a best practice session at the forthcoming 2007 BE Conferences, held in the US and Europe next Spring. Applications are due November 30, 2006. ***www.be.org/CallforPresentations***

Bentley releases RAM Structural System V11.0



Bentley's RAM International Solutions Centre has released version 11.0 of RAM Structural System, the modelling, analysis, and design software for structural engineers. The system features building analysis, design and drafting for both steel and concrete structures. ***www.bentley.com/structural***

Autodesk launches customer advisory councils



Autodesk has launched two online customer councils for its flagship architectural solutions, Revit Building and Architectural Desktop. The new online customer advisory panels will provide an opportunity for Autodesk's architecture customers to communicate directly with the product development teams. ***www.adtcc.com*** / ***www.revitcc.com***

Spicer Imagenation 8 Svp1 supports AutoCAD 2007



Spicer Corporation has released Imagenation 8 Service Pack 1 featuring new AutoCAD DWG 2007 support. Spicer Imagenation is designed to help AEC professionals efficiently access, scan, review, mark up, print, and archive a variety of document types. ***www.spicer.com***

Design matters

Autodesk sponsored the American Pavilion at this year's Venice Architectural Biennale, where the company also hosted an evening on the topic of sustainable design in the face of global warming.

When Autodesk holds a marketing event it is usually to do with one of its products, either an imminent launch or some new technology that it's pulling the covers off. In October, Autodesk took a number of key clients and prospective clients (and press) to Venice to attend the Architectural Biennale, an international month-long exhibition where each country has a pavilion to present themed installations - this year on 'Cities, Architecture and Society'. There was no hard sell, no new products to push and it wasn't an in your face BIM pitch (how many of those have I heard now?). Instead, it was a really refreshing and thought provoking event, asking questions about how we can improve our designs.

Autodesk had been a key sponsor of the American Pavilion and Phil Bernstein, VP of Autodesk's Building Industry Division, came over to chair a number of media events. Our first stop off was the other side of Venice, a 20 minute boat ride away.



Phil Bernstein, Autodesk VP Building Industry Division.

Impressions

I'd never been to Venice before. I arrived late and night and decided to go for a wander. The heat, even at night was a stifling 27 degrees and it was humid. With no map I wandered off around the twisty streets, crossing numerous bridges and trying to mentally overcome the complete lack of roads. The consistency in the architecture truly makes it an enchanting place and at night, you really can have the place to yourself. I eventually managed to get to St Marks Square, which was impressive in its majesty and the fact that nobody else was there added to it; even the Gondoliers had gone to bed. The impressive bell tower has stood proudly over this city for, umm, less than 100 years, as the original fell down after centuries of successive earthquakes. The Venetians didn't want to rebuild it but funds came from the mainland and it was rebuilt. I didn't find that out till I got back! I think I spent five minutes looking at the pointing on its bricks thinking it had been kept in good nick. It pays to know a little about where you are going in advance. I should also have read about Venice's man-eating mosquitoes and gone prepared, as the Biennale is held in a 'garden' that might as well have been a Louisiana swamp, but that's another story.

Taking the water taxi to the event gave the best views of the city, around the canals and then all along the grand canal into the Lagoon to the far side of the main island. Venice is indeed a beautiful place to visit, however in the summer during the day, it just has too many of us damn visitors to be pleasant. Having found my sea legs it was time to lose them and get ashore and visit the exhibition.

Santooth housing by Eight Inc.



Venice Architectural Biennale

The American Pavilion contained an exhibition entitled 'After the Flood: Building on higher Ground'', organised by the editors of Architectural Record. It proved to be a very moving exploration of New Orleans before and after the devastating Hurricane Katrina. As you entered the building a massive timeline showed the historical setting of Hurricane Katrina versus a range of other natural disasters that have hit New Orleans in it's past. It also highlighted the sheer size of devastation the Hurricane reaped on the 100 mile section of coast line. Katrina may well have been one of the biggest Hurricanes to hit New Orleans but with the timeline of events, it was obvious that the city was built in a problem area and it was probably only going to get worse if the predictions of global warming prove true.

The next installation was a sealed off area where a projection of the animated satellite images showed Katrina develop, grow into a category five hurricane and head towards New Orleans. It was the third largest Hurricane ever recorded to it land and was America's most deadliest and expensive natural disaster. Levees separating Lake Pontchartrain from New Orleans were breached by the surge, ultimately flooding 80% of the city for weeks, causing $81.2 billion in damages and killing 1,836 people.

Moving though to the next display the room had many images of the destruction on all the walls, with projected video on the floors with natives of New Orleans recounting the stories, or driving/walking around their neighbourhoods. The US Government's response was widely criticised and in fact, the theme of the American Pavilion was in tune with another Venice event that week, the film festival, during which Spike Lee launched his documentary film 'When the Levees broke: A requiem in Four Acts'.

The final installations were a showcase of winning designs of an international competition to replace the housing in New Orleans. The design competition was organised by the Architectural Record and Tulane University's School of Architecture and showed ideas single-family and multi-family housing. The exhibition also included some urban planning designs such as a park, as well as some sustainable designs which were entries from a competition sponsored by Global Green USA and film star, Brad Pitt. Pitt is actually a running theme in this article. He's very interested in 'green' architecture and I know he did a stint at Frank Gehry's practice in California, but more on his involvement later.

The models on display were really first rate, Eight Inc's Sawtooth housing model was probably the most impressive. My only worries were that there seemed to be a lot of glazing in all the designs. Having just walked though a room full of pictures of tower blocks with not one window pane left, you had to wonder if the architects were planning on using bullet proof glass or not! Some debate was had, as to whether people should be building there in the first place, as the area was low-lying and prone to Hurricanes. But the decision isn't really there to be made, humans build in some of the most dangerous areas and live in bliss for hundreds of years 'til the big one hits. Think San Farncisco, Pompeii, Montserrat, Banda Aceh. If New Orleans is to be rebuilt, the new designs have to take into account the possibility of this happening again, sooner or later.

We took a guided tour around some of the other country's Pavilions. With the 'city' theme, many of the displays dealt with China-related projects. With China using 50% of the world's concrete, it's probably not surprising that China would also be using design talent from other countries. With that view, the Danish Pavilion was probably a misnomer as nearly everything inside it was related to China. These were huge housing projects on a scale that I hadn't really seen before. We were told China is building a NY 'Twin

Towers' every hour and is building an area the size of Manhattan every month. This is a scale of building that probably hasn't been seen on the planet.

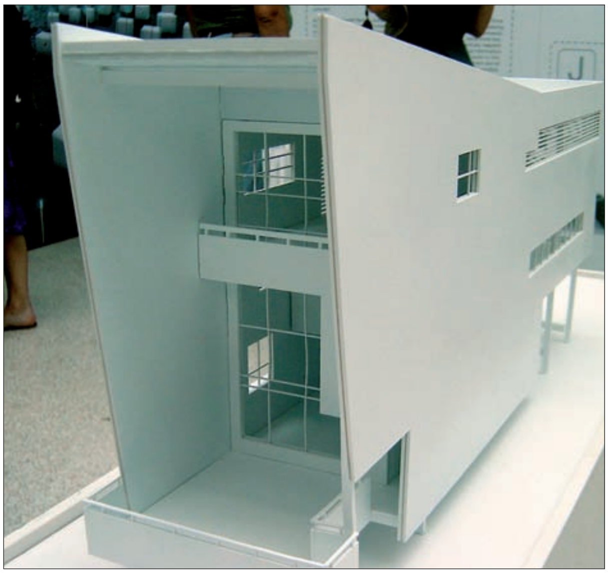
With so many buildings going up and the requirement for water, power and other resources, the Chinese government has been looking at how the designs of the buildings can make the best use of these resources as there is only a finite amount of them. But still, this is big infrastructure and buildings are polluters, it's almost impossible to comprehend the scale of what's going on in China. Some of the Danish designs were amazing in their size and aesthetics but I couldn't help thinking that the Chinese are replicating the errors of Corbusian 1960s concrete flat design. Maybe in 25 years time there will be a generation of Chinese malcontent kids spraying their estates with graffiti and urinating in the lifts.

There were many other displays of note. I was particularly taken with an interactive MIT device which was a box filled with polystyrene beads. As you moved the beads around, creating topology of hills and valleys, somehow the computer could read these and then project onto the box a multi-coloured display of the variations in height. And it did all this in real-time. It reminded me of Sim City. You could play God and shape any landscape you wanted. There were also some innovative solutions to the transport problem. The Japanese pavilion provided respite from the tower blocks and cities with designs made from natural fibres and materials and not an urban population in sight.

It's probably just me but from wandering around I realised I find cities depressing. The urban sprawl, the transport problems, the waste generated, the dirt and the grime. They are so artificial but 'pure' mankind, machines that we design to live and work in. The way we have lived, post Industrial Revolution has meant we have little choice but to opt into one of these beasts and fight it out with everyone else. By 2050, over half the world's population will live in cities. With our inability to stop fuelling Global Warming and years of inefficient building design to overcome and a short -term financial–return based outlook for most of our future building stock, you have to wonder where we are going.

Sustainable design

I didn't have to wait long to get the answer to that. A quick blat by boat back to our hotel to briefly enjoy the not-so-green air conditioning and count the number of mosquito bites, and then we were whisked off to



Amin Gilani & Josh Spoer University of Texas.

an evening of presentations on sustainable design. Autodesk had sponsored a six part TV documentary series entitled 'Design:e2' (The Economies of Being Environmentally Conscious), narrated by Brad Pitt and it explores design through the eyes of the thought leaders in sustainable design, looking at how technology can transform the world around us and how we can build a sustainable future.

As the film started, Carol Bartz, ex CEO but still at large in Autodesk gave a piece to camera about the challenges that face designers and all of us with regards to sustainability. I think I was a bit dubious at the start but you soon realise that this series (we only saw one out of the six), really was an excellent production and wasn't about selling Autodesk product at all and you can't fault Autodesk for supporting such a thoughtful and challenging topic. In some ways it's the design-specific equivalent of Al Gore's 'Inconvenient Truth' but the twist here is that while Gore is light on the remedies, making it a tad depressing, this program explores what's being done and where the leading edge research is heading.

The Episode we watched, entitled Deeper Shades of Green, started off looking at the Singapore National Library, were architect KenYeang explained how in his design he wanted to make the building intelligent and efficient. While not being 'zero emission', the building features escalators that only work when someone is near them, and automatic shading and venting to use as much natural conditioning as possible. I couldn't help thinking in green terms this is 'low tar' but as the program progressed the views got more radical and experimental.



St Mark's Square's new bell tower.

William McDonough of William McDonough and Partners then really started to make us think. He held up a water bottle (Evian, Volvic, name your water), and commented 'This bottle is made with a poison that makes it un-recyclable; there's no need for that to be in there'. He went on to ask, why don't we think ahead when we design to put positives into the recycling process. If you are making paper plates why not make sure there's lots of hydrogen in there so farmers want them to bury in their fields? McDonough was excellent at pointing out how lazy design is assisting in ruining the planet.

Werner Sobek, an architect and professor from Stuttgart then appeared and gave us a tour of his zero emission house, together with examples of his students work and actually turned up at the event to give a fascinating in-depth presentation on the research he is now doing. The main fact that came across is that zero emission is not easy and a lot of the recycling has to happen locally, not elsewhere.

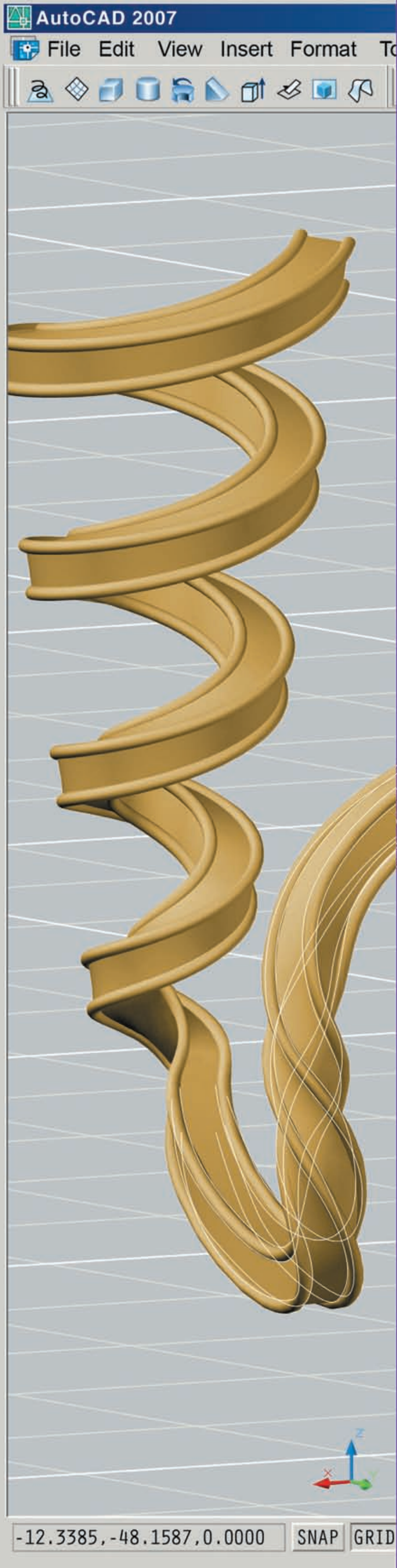
I highly recommend seeing the programs when they air, sometime in Autumn in Europe. At the event Autodesk folks were talking about the possibility of it getting on British TV. I really hope that they get something sorted.

Robobat and Autodesk

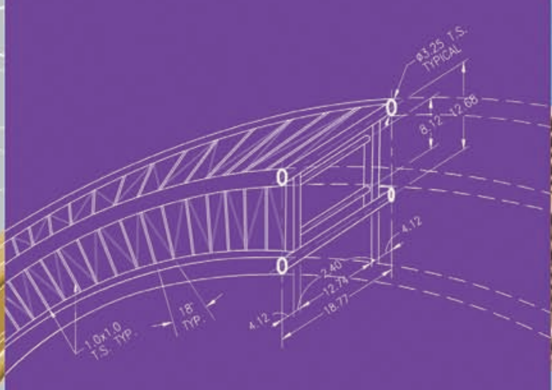
Autodesk's take on sustainable design is that it wants to provide the tools to give designers really useful feedback as the design progresses. With 2D design, this can't really be done. But as the industry moves to 3D, Autodesk will look to provide tools that will help designers understand the environmental impact of their creations. As of yet Autodesk has little to offer but shortly before the event, Autodesk announced that it had purchased a French structural analysis developer, Robobat. This has little to do with sustainability but does indicate that Autodesk will be looking to buy in analysis technology now, as opposed to partner. Revit Structure offers links for other developer's solvers to link to the Revit model. This purchase could cause problematic relationships ahead for Autodesk in this field. I am sure others will follow.

I am impressed with Autodesk talking about a pertinent design issue and putting on such an esteemed event with lots of thought provoking comment. It's the kind of stuff that makes you want to go live in a Tipi and live off the land! So long as there are no mosquitoes nearby.

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AutoCAD 2007



Acrobat 8 Professional

Adobe has updated its PDF creation range of products and free viewers. It seems Adobe is not just interested in documents anymore but also real-time business meetings, says Martyn Day.

PDF has become a de facto standard in many businesses – perhaps, in many cases, just for the lowly capture and distribution of company information - but reading through the product feature list you soon begin to realise that Acrobat is a real 'Swiss Army knife' style application with many potentially useful capabilities that don't get that widely used.

In a generic business sense, PDFs could also be used as part of an email solution, archiving your Outlook contents for safe and compressed access to emails. While project documentation may be created in a number of different applications, with digital and paper-based correspondence, all these pages can be brought together within a PDF to require only one application to read, print and mark it up. PDF could be a collaborative solution for the proofing of most documents (with a nice integration to Microsoft Word). Adobe has made PDF an open archiving format too, so it could be used to store all old digital or paper (via a scanner). PDF documents can be watermarked/digitally signed and protected for safety in an extended distribution. Electronic forms can be fairly easily generated as PDFs, emailed, filled in and returned. If you are browsing the Web and want to capture a website, you can extract it out to PDF, to a number of user-specified levels, always having a copy of a website as your reference on your laptop – although this is a one time snap shot and will need updating. Alternatively PDF documents can be incorporated into websites as additional content.

I'm thinking off the top of my head here, there are many other uses for Acobat in a typical working environment and I haven't even started to consider the explicit requirements of engineering, which Adobe started to really concentrate on from Acrobat 6 onwards. This is why when I think about Acrobat, I think a Swiss Army knife for documents.

At first glance the product suite is a little confusing as Adobe does offer a troupe of Acrobats! Today, the Acrobat family consists of Acrobat 8 Professional, Acrobat 8 Standard, Acrobat 8 Elements, Acrobat 3D Version 8, and two new products called Acrobat Connect, and Acrobat Connect Professional (which are both accessible from within Acrobat). As one would expect these offer different levels of functionality at a number of price points. I'm only going to concentrate on the features within Acrobat Professional as it is the version to get if you're using a 2D CAD tool like AutoCAD. Acrobat 8 Standard, Professional, Connect and Connect Professional will all be ready to ship around November. Acrobat 3D Version 8 will not ship until some time early next year. Acrobat 3D version 7 only came out earlier this year and is a specific version of Acrobat that deals with 3D models from all kinds of high-end CAD applications. Version 8 will include powerful CAD format technology that Adobe recently acquired along with a data translation company in France, TTF. Adobe had been using Intel's U3D tessellated file format but it lacked community support, so in addition Adobe will be including TTF's PRC format in Acrobat's 3D functionality, allowing very high definition (yet small file size), non-tessellated models to be included to PDFs, which are good enough, so Adobe keeps saying, to manufacture directly from!

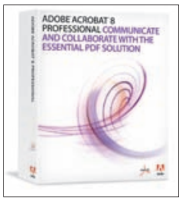


According to Ralph Grabowski (www.upfrontezine.com), the forthcoming release of Acrobat 3D Version 8 will also export drawings/models in STEP, IGES, and Parasolid formats. And Grabowski states that this means the product becomes a sub £1,000 3D CAD drawing translator. It's clear that Adobe is really looking to offer some very high-end capabilities in PDF for manufacturing but this product will appear early next year.

Web collaboration

Back to the current release of Acrobat 8 Professional, Adobe has added some significant new capabilities within the family and the most glaringly obvious inclusion is a vamped up Macromedia Breeze product, to allow remote meetings to take place. This, I think, has a fair amount of generic appeal, although it does compete against a number of free 'instant' and video messaging solutions that are out there. Called Adobe Connect and Adobe Connect Professional you literally have a digital office, where you can arrange to 'meet' people (up to 15 at once) via a number of ways; Voice

It's worth upgrading for the speed improvement on its own to be honest - it's that dramatic, especially for use with the web and DWGs.



Over IP (Internet Telephony), video conferencing, text-based Instant messaging and you can share documents that are on your desktop, like a PowerPoint, or a document up for review, perhaps even a 3D model. What's neat about Connect is that it's an all in one interface and it captures everything that's written or said, so you can keep track of meetings. To do this with a hotchpotch of applications would be a pain.

The standard Connect is a subscription service paid per month or per year. Connect Professional adds features like bigger group capability, audience polling, customised layouts, the voice capability and multiple meeting rooms – this is paid on a per company basis depending on the number of users. Organisations can deploy Acrobat Connect Professional in either an on-premise, behind the firewall configuration, or through Adobe's hosted service.

It will be fascinating to see how Adobe fares with this part of the Acrobat family. Remote meeting technology is not new but is gaining ground. Adobe has pulled all the formats together to make a professional suite but is offering it as a hosted service. Maybe the market is right for this technology and a 'professional' level product. I am sure we will review Connect separately after Acrobat ships.

Acrobat 8 features

I've been playing with the beta of Acrobat now for a couple of months. I have both the Apple Mac and PC versions. At this point, it's worth pointing out that that there is no Mac version of the Acrobat 3D product and unlikely to be one, Apple Macs just don't get used in the 3D CAD space that much – although with the new Intel-based Macs and products like Boot Camp from Apple, enabling a Mac to become a Windows or Mac OSX machine, a Mac could possibly run Acrobat 3D.

The first thing I subliminally noticed was on installation with Acrobat adding some acceleration technology to my web browser. The benefit of this only became apparent when I accidentally clicked on a PDF on a website. Out of habit I have learnt not to click on PDFs on websites as everything slows down as Acrobat launches, I just opt to read an HTML of the PDF. With 8, I didn't even have time to regret or even notice I had clicked on a PDF, it was almost instant. I only checked what I had loaded as there was a slick document interface that had appeared in my browser and I didn't know where it had come from. This, I found out, was the new look Acrobat interface.

So, the longstanding speed issue has been

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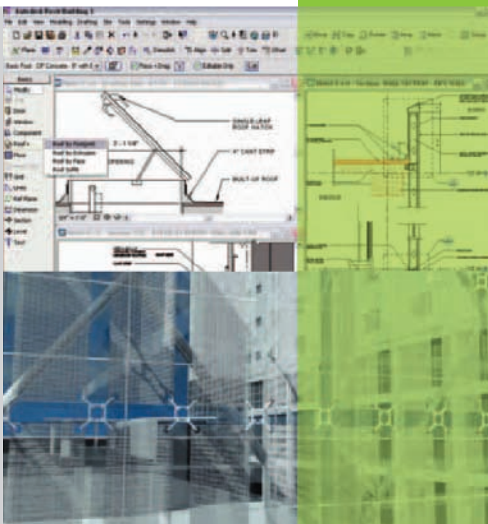
Idea:

Improve an architect's business by providing a more complete way of thinking about building, from design through to construction.

Realised:

With Autodesk's® Revit® Building, design teams achieve superior documentation, more effective design co-ordination and more productive collaboration. Your clients are happier, so you see more repeat business and a more profitable business. Created specifically for Building Information Modelling, Revit Building can help you realise your ideas to compete and win.

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continued from page 12

addressed in this release and this is on many different levels, from loading up to PDF conversion. I am pleased to report there have been some major improvements. File conversion of DWGs now no longer needs AutoCAD to be present on your machine, you can just drag and drop a DWG into a PDF and the conversion process is noticeably 100's of times quicker than Acrobat version 7.

Redaction

Also new to Acrobat 8 is a redaction tool. This capability allows you to go through documents and literally block out sensitive lines of text from documents to safely send information to other project participants. Acrobat also checks unseen data like metadata, headers and footers to make sure that phrases or words have been removed and blacked out within the document,. This works with digital docs or scanned in and OCRed (Optical Character Recognised) text. An example would be that you want to remove the name of a product from a document, so you search out instances of that product name and get Acobat to block it out before you send that PDF to someone. This is clever stuff.

Forms

To create a form for collecting information, Adobe didn't always have the easiest solution to get your head around. In Acrobat 8 it couldn't be simpler. There's a new auto recognition capability which means you could create a form as a simple Word document and then get Acrobat to auto-create a PDF form from that layout, with the application automatically working out where user-fill-able fields should go. Acrobat also comes with a Forms design package that is really easy to use and puts PDF form generation in the hands of all users.

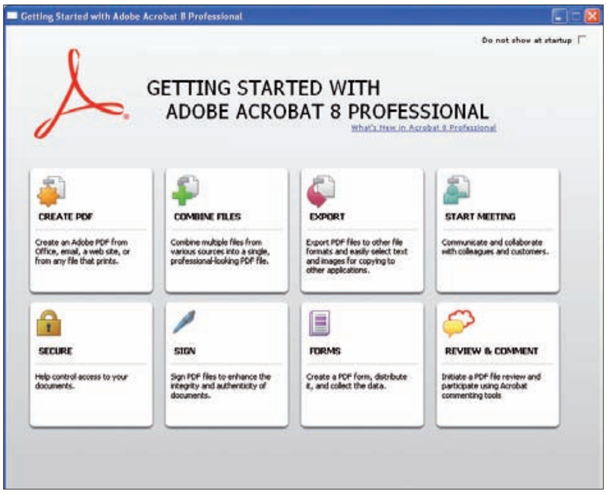
PDF package

Acrobat 8 users can bundle and send documents in a "PDF package," which works like ZIP folders but with be password-protection and encryption. Packages can contain PDFs, as well as the real native files from other applications. It also supports 'nested' protected PDFs, or ones that have been previously digitally signed.

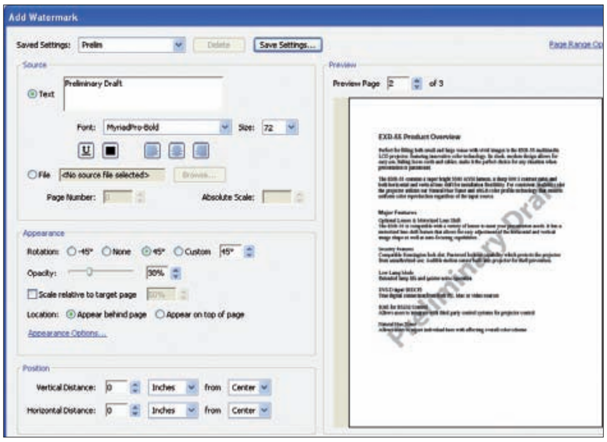
In the past all the docs would have been put in a single PDF as 'pages' within that PDF file, the process would break any existing digital signatures. Now, staking the documents means previously protected docs can be included and the encryption protection can be applied to native docs, not just PDFs. PDF Packages are just a bigger wrapper, I guess, but it also means that Acrobat could be used a security tool for any documents that you want to transmit.

CAD

When you install Acrobat 8 Professional on a machine with AutoCAD, it adds the PDF creation button to the menu bar. In fact when you install Acrobat onto a







machine, you'd be surprised as to where PDF creation tools pop-up, in most applications, on the right click, Print or pull-downs, Acrobat gets its presence noticed.

The battle is on for the hearts and minds of the Autodesk installed based with regard to web formats. Autodesk is pushing DWF, while Adobe is pushing Acrobat PDF. DWF is free in nearly all Autodesk products, PDF is also now 'free' in the latest release of AutoCAD, as Autodesk added its own PDF creation tool in there (not using Adobe's PDF libraries). PDF out was No.1 in the AutoCAD User Wish List for a number of years, and with Autodesk on the DWF campaign it was a strange move to include a PDF writer in there as it's a double edged sword to DWF. It will however, make some users question the need to purchase Acrobat perhaps, Adobe will have to make the case as to why Autodesk's version of 'PDF out' is not a replacement.

Acrobat 8 Professional offers the capability of flattening AutoCAD layers. There's a handy Batch mode to convert huge numbers of DWGs to PDFs. And it's worth mentioning again that you can now just drag and drop DWG files into Acrobat to make a PDF - and you don't even have to have AutoCAD or LT on your system to this. You can combine multiple layouts or drawings into one PDF and package them up with the PDF package utility (as explained above). It's also possible for an Acrobat 8 Professional user to now enable the Watermark capability within standard, free, Acrobat Reader. There is a rudimentary dimensioning capability in case you need to add them to a drawing. As they use a different dimensioning style they stick out like a sore thumb against any existing dimensions but perhaps that's a good thing, you know what was original and what isn't.

Conclusion

Acrobat has had a good general work-over and clean up in this release. It's easier to use, faster, more capable and just feels smarter. It's worth upgrading for the speed improvement on its own to be honest - it's that dramatic, especially for use with the web and DWGs. Removing the reliance on having AutoCAD present to make PDFs will benefit LT users everywhere, although I do wonder what libraries Adobe is using for this conversion and if the PDF is as accurate as performing the conversion using an 'official' Autodesk product.

Adobe's strategy appears to be two fold for Acrobat's development, go deeper into verticals (3D) and broaden the range of rich media types it can work with and services it can offer (Connect). The purchase of TTF is more than just an indication that Adobe has big plans for the MCAD (Mechanical CAD) space, although these have yet to be fully explained. The development of Connect really takes Adobe into a different place, covering voice, video and real-time collaboration. In a strange sense, Adobe is moving away from just looking after the documentation side of things to playing a more active part in providing the forum where group decisions are made to now amend, alter and edit the information within the PDFs.

Many Adobe employees keep quoting that 'you will be able to manufacture from PDF'. This is probably the best indication of where Adobe wants to take things in the vertical MCAD market. For now this is a tad scary concept as Adobe has really only just stuck its toe in the MCAD sector, I'm not too sure how far many engineers will trust a PDF, in terms of accuracy, especially when manufacturing has so many dedicated products to it. However, I do like the concept that in the future, if you break a part on a car, you email your local body shop with the PDF of what you need, for them to 'run one off' from their rapid manufacturing system for you to pick up. I'm guessing Adobe see the engineering market as a good bet for PDF as it could act as a unifying format in an industry that has no unifying format.

www.adobe.com

Interview: Joe Croser, Bentley

Martyn Day caught up with Joe Croser, Bentley's Global Marketing Director, Platform Products, to talk about MicroStation's new 3D interface, the improved 3D graphics pipeline and support for Microsoft's forthcoming Operating System, Vista.

Martyn Day: Looking at MicroStation V8 and V8 XM, there seems to be two distinct categories of work being done; the architecture/database and then the GUI graphics and front end. How much of V8 is new and how much of the old pre-V8 MicroStation is still in there? Was the whole V8 program a multi-year, managed rewriting of MicroStation? Is it complete now?

Joe Croser: Great start Martyn! You have hit the nail on the head. Our V8 Generation of products has indeed been a multi-year project, the latest development being the V8 XM editions of MicroStation and ProjectWise, which were released earlier this year.

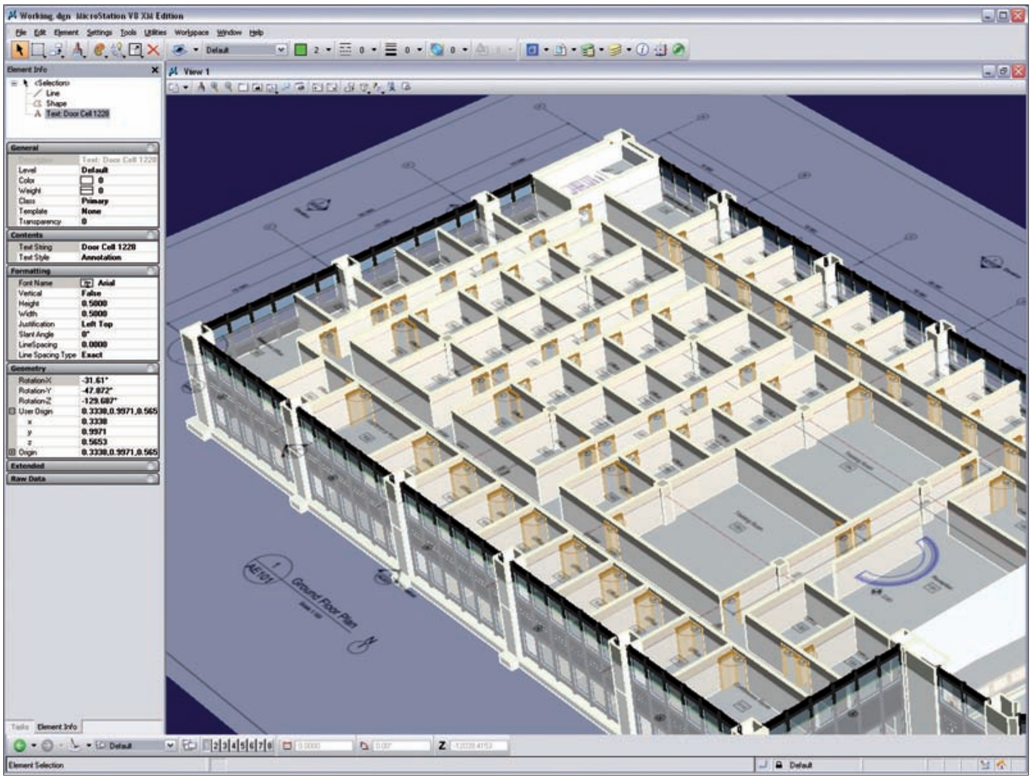
Why has it taken a generation of V8 to make the changes? Software technology and product development is a constantly moving window, and so the developmental challenges we face as a company are shaped by our industry, the needs of our users and by our users' readiness to embrace change. At Bentley, we provide users with a comprehensive portfolio of software to design, build, map and operate the world's infrastructure, and many of our users rely on a number of different products from the portfolio to get their work done.

Hence, one of the greatest challenges faced by our development teams is the continued provision of forward and backward compatibility, across different versions and across different applications. Some software developers factor out this obvious need to maintain compatibility in favour of new features, but that has never been our practice. Infrastructure is unlike many other industries (including manufacturing) in that a project can run for years, perhaps even decades throughout its lifecycle, so bi-directional compatibility is a fundamental requirement for all large projects and organisations.

This is one of the reasons why we have adopted a common platform for application development, enabling us to innovate in MicroStation and derive wholesale benefit from that innovation in every other vertical application. Indeed, the V8 Generation has enjoyed substantial innovations that have driven many changes to the file architecture and to the user interface and graphics engine.

When we released the first V8 Generation of MicroStation in 2001, we changed the DGN file format for the first time in its 17 year history, and we have not changed it again since. This one change enabled us to dramatically raise our headroom and create space for new innovations across the V8 Generation of applications, and the list of innovations is long. The innovations have included Design History, Digital Security, PDF creation and referencing, SharePoint integration and the greatest innovation of all, interoperability. Providing direct, in-place editing of DWG – without translation – and the new EC Framework; an interoperability layer connects a world of infrastructure applications.

In the V8 XM Edition of MicroStation, we see the new user interface and experience the power behind the new DirectX graphics engine. It is therefore hard to say exactly how much of the MicroStation V8 XM Edition consists of pre-V8 code. We have changed enough thus far to entirely change the look and feel of MicroStation and yet we have retained enough of the old code to maintain forwards and backwards compatibility for all versions of MicroStation – not just the last three.



MD: Could you explain a little about how MicroStation acts as the platform for the Bentley vertical products and how, as a division, you would select what features need to be added to each release to co-coordinate with these products. If seems like you must be being pulled in many different directions!!

JC: I could speak all day about how MicroStation acts as a platform to our comprehensive portfolio of vertical applications and the benefits it delivers to our users through unparalleled interoperability, but I will try to keep it brief. Essentially, to serve common needs across different applications and industries by developing in a single platform, we are able to concentrate our innovations at an operating-system level for widespread benefit. Think of MicroStation as our operating system for the vertical applications, much like Windows is to Microsoft Office. In MicroStation, we build in many common functions that dramatically and positively affect interoperability in the verticals.

At a platform level, we have recently introduced what we call the Engineering Component (EC) Framework, which enables applications to share data without loss. This is the framework that we are using in our Civil development team to enable InRoads, Geopak Roads and MX to all create, manipulate and edit the same data using different applications. Previously, they all stored their data separately and shared it with some degree of loss. So why, you may ask, are we doing this?

Vertical products are rapidly gaining favour across the infrastructure industry in the face of a global skills shortage. Users are striving to increase their productivity and quality by going vertical and adopting point-solutions in order to process an increased workload, with the same size team. At Bentley we recognised this industry trend more than 10 years

ago. That was when we laid the foundations for our comprehensive portfolio and started executing on our acquisition strategy. In the last five years alone, we have made about 20 strategic acquisitions that have enabled us to extend our portfolio considerably. These acquisitions are detailed in our annual report online **www.nxtbook.com/nxtbooks/bemagazine/ar2006/index.php.**

Another good industry example is the plant industry, which is exploring every available avenue to deal with its volumetric increase of work. The plant industry went vertical years ago, so more recently it has been managing its increased number of projects by spreading the workload across distributed enterprises using collaboration technologies like ProjectWise – a scalable system for collaboration that enables distributed enterprises and related organisations to successfully deliver infrastructure projects.

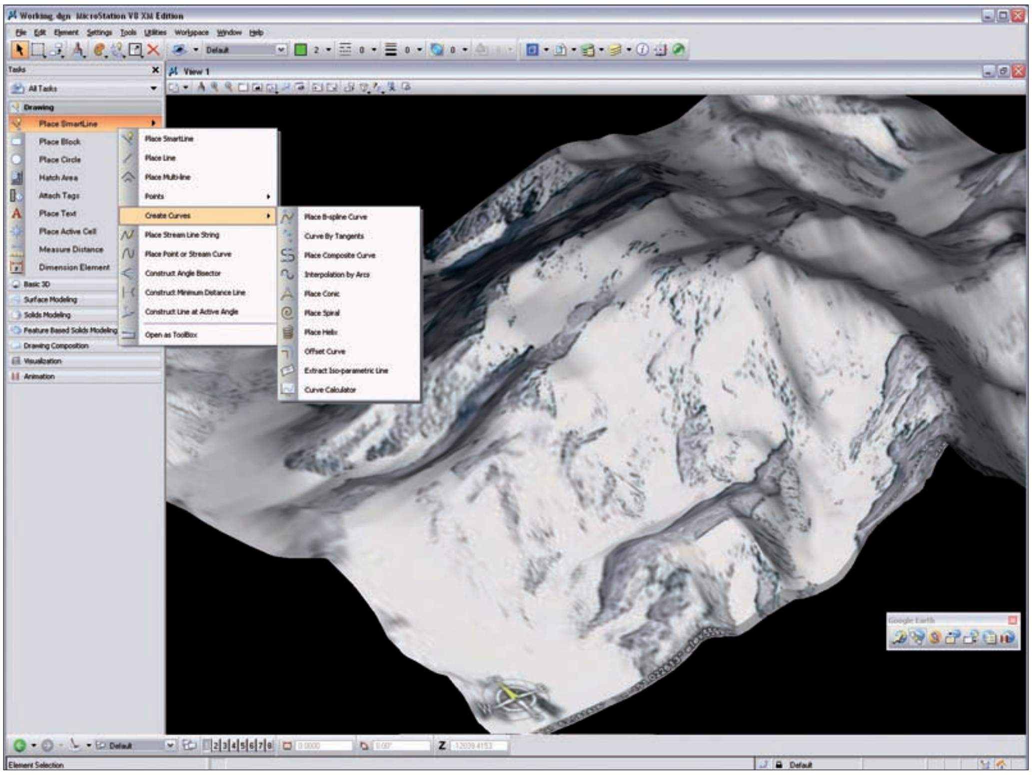
Of course this is all background to your question. We used to resource development by first designing the platform before passing it to the vertical development teams to build their applications on top. This approach led to much duplicated development work being done by each vertical and resulted in too many different tools being created to essentially do the same thing. This also confused users of one application and confounded those trying to switch between a number of applications during design.

Hence today we approach the challenge differently. We now have vertical development teams working inside the platform team, which dramatically increases positive communication between all groups within platform and between the platform and the vertical teams. More development work is now being executed once in platform for the benefit of all four verticals and their applications. The result is increased innovation in MicroStation and an increase of innovations by MicroStation in the vertical applications. User productivity is being driven through the roof with the same number of people on each team.

MD: How hard have the verticals been pushing for increased 3D performance?

JC: 3D is everywhere now and I don't think there is an organisation out there that would not want to benefit from increased 3D performance. We recognised the value of 3D early in the development of MicroStation and we led the charge to improve it. 3D has always been a Bentley strength, and in MicroStation, we remain ahead of the field in modelling capabilities with general solids, parametric solids, surfaces, NURB surfaces and the new mesh modelling tools. Of course, there is also the new technology that I know you have eagerly followed through its development, Generative Components. GC is entirely new and an incredibly powerful technology the like of which is not available outside of MicroStation and the vertical applications that contain MicroStation innovations.

But I don't think that the benefits reaped by the verticals are necessarily held hostage by 3D performance. The vertical teams constantly drive the platform team to develop new technologies that enable them to create more user-friendly products



that interoperate seamlessly. And again I understand why few professionals use the same tools for concept, design, detailing, analysis and production. So, I think the value inherent in using vertical applications is realised through a greater versatility as well as better 3D technology.

Certainly, 3D was the big visual change for users moving from CAD drafting to BIM, and great value is associated with using a single model to coordinate designs and extract many drawings There are also higher returns to be had from simply sharing data without loss. With Bentley solutions you are able to move your architectural model to a structural environment without loss and by being able to round-trip your structural design model and your structural analysis model while modifying and enriching the data and associated drawings.

Another great benefit is the presence of a common and familiar interface across different applications, so that when you move between different vertical point solutions, you remain in an environment that is familiar and configured with the same tools.

MD: From talking with Keith Bentley, even he couldn't wait to get the front end of MicroStation 'into the 21st Century'. What kind of technologies has Bentley selected to use in the new graphics part of the CAD system and what kind of advantages will end-users most obviously see?

JC: You know it's funny how we all become accustomed to what we see every day, it becomes the norm and anything different is at first disparaged as being abnormal, sometimes even weird. I remember having conversations with you about MicroStation's interface being "old and 3D unfriendly" and I remember the conversation you refer to here with Keith and I remember thinking "…Martyn is wrong, MicroStation is a great 3D tool. How can it be 3D unfriendly?"

So now I fast forward to September 2006 and I look at the new MicroStation V8 XM interface and I think "…this is such a nice place to spend some time, this feels like a really cool place to work, this is a great interface for 3D!" …and I get used to it. Now the V8 XM Edition interface is the norm and anything that went before just doesn't cut it as well. Now I can see that you might have had a point – but it's the last time I'll admit that to you! And knowing that with V8 XM we slingshot MicroStation into the 21st century makes it easier to say too.

So what of the new graphics technology in play? Well it is all built around the DirectX technologies from Microsoft. Simply put, DirectX is a Windows technology that enables higher performance in graphics on your PC. At the core of DirectX are its application programming interfaces, or APIs. The APIs act as a kind of bridge for the hardware and the software to communicate. The DirectX APIs give multimedia applications access to the advanced features of high-performance hardware such as 3D graphics acceleration chips. They control low-level functions, including 2D graphics acceleration; support for input devices such as joysticks, keyboards, and mice. Because of DirectX, what you experience with your computer is better 3D graphics.

When I talk about it being a Windows technology

"One of the reasons we have adopted a common platform for application development is to enable us to innovate in MicroStation and derive wholesale benefit from that innovation in every other vertical application."

> **"We have paid considerable attention to the way a gamer moves around their immersive gaming world and we have emulated the same ease of movement around 3D models with some new tools in the MicroStation V8 XM Edition."**

I make that reference with two things in mind. First it is a Microsoft technology for the Windows platform and second (and because of this) it is optimised for Windowed applications making use of many concurrent windows or view ports. This specific optimisation means that graphics hungry applications like CAD, BIM and 3D modelling products that frequently have users working through a number of open windows in the application, can process data much faster – even for the hidden windows. This DirectX, multi-windowed performance is in stark contrast to older technologies such as Open GL which was only ever optimised for applications working in one active window or view port at one time. An example of old, un-optimised technologies that continue to use Open GL would be Revit.

MD: There's always a risk in changing the interface for users, and here we acknowledge that Bentley has tried to minimise the impacts of technology upgrades on users, having only had one major file change in the product's history. While there may be a classic interface for 'old' users to work with, is this 100% of the old GUI (i.e. how are new features supported in the old GUI). Are there migration tools provided with SELECT, and to really get the most out of the new functionality, will users need to migrate to the new style interface? (Am guessing there's a productivity argument to be made here?).

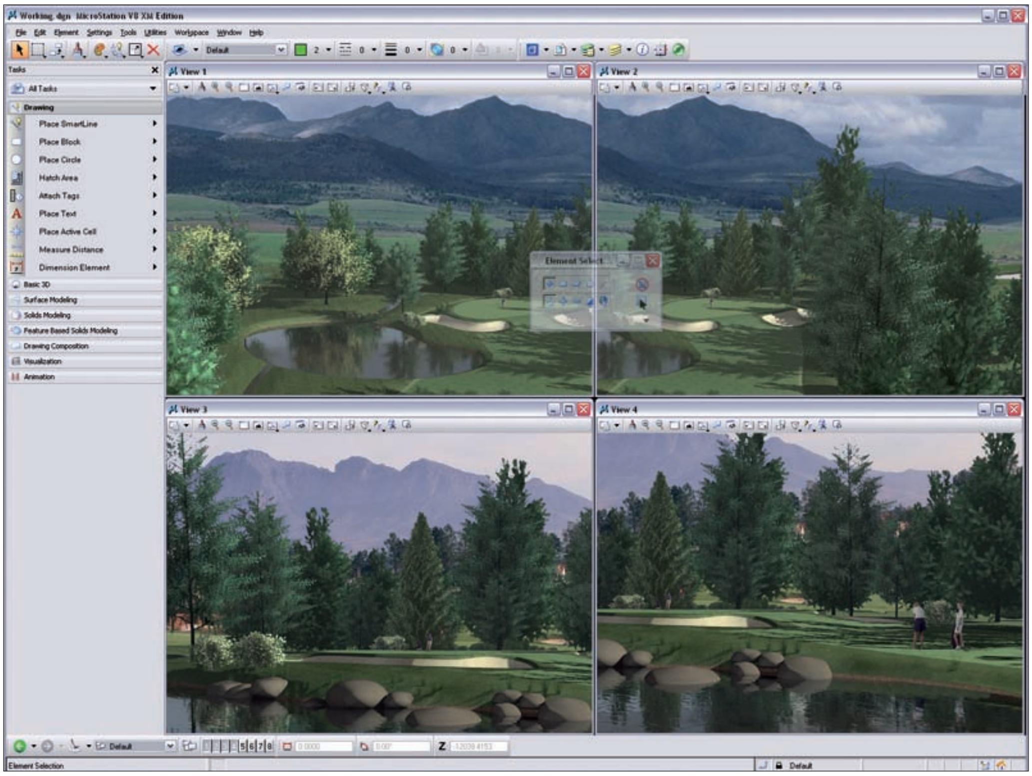
JC: I hear you and we understand that changes to software can place the productivity of our users at risk which is precisely why we work as hard as we do to make change a positive thing for all of them. With the V8 XM Edition we ran extensive usability sessions on all aspects of the development which necessarily included at all times the interface. Hence it was tested, tweaked and retested over much iteration to ensure that it was not only easy to use but that it worked as designed.

I don't think that the "classic" interface as you put it is a thing for "old" users to work with thereafter. It is a way of smoothing the transition so that the UI changes made available to the users in the V8 XM can be adopted at the users own pace. The classic interface is also beneficial for organizations that have customized their MicroStation UI – they need a route to embrace the new edition without being forced to make wholesale changes to the way they work immediately.

Of course SELECT users benefit through the many routes to technical assistance and online learning opportunities. All new and renewed SELECT agreements now benefit from two online eLearning courses for MicroStation V8 XM as well as the many technical documents that are available in the online SELECT knowledge base. Furthermore, subscribers to the new online Bentley LEARN Server http://www.bentley.com/learn can take advantage of a number of multi-media hints and tips videos.

Bentley LEARN is a subscription companion to Bentley SELECT that gives organizations unlimited access to OnDemand eLearning from the Bentley Institute. Bentley LEARN removes the common barriers to learning such as time, topics, and cost so that organisations can get the training they need to be more productive and to remain competitive.

MD: Could you highlight the biggest changes in end-user experience with the new GUI?



JC: I think the biggest changes in end user experience result from the new combination of tools and workflow in an integrated user interface. The patent-pending "Task" technology is a key innovation in the V8 XM Edition along side "Element Templates", a new standards-based innovation for working consistently to create consistent work.

MicroStation Tasks enable administrators and users to match their workflow to their tools for dramatic productivity gains. A typical series of tasks (with a small "t") done in the previous version might have included 20 clicks of a mouse to select the correct attributes, select the right tool from a toolbox before placing the data and then arranging it with the correct draw order etc. With a combination of Tasks and Element Templates the same process could require a fraction of the clicks. And when tied into the new patent-pending Keyboard Position Mapping the click rate is reduced by another order of magnitude.

The net benefit is higher productivity with more consistent work done in accordance with project standards. And of course, because these are innovations by MicroStation they are all made available for the vertical applications. Hence the speed of task completion in a BIM application based on MicroStation V8 XM Edition is also greatly enhanced.

MD: A new interface and improved 3D performance are obviously welcome. Does Bentley think that perhaps MicroStation's old interface somewhat impaired customers move to 3D? There's obviously a massive cultural element to this, how does 3D usage differ in the vertical areas in which Bentley operates? Which is the fastest growing adopter of 3D?

JC: I don't think we have experienced any problems regarding users delaying a move to 3D – indeed our users have in many cases been advocates of 3D for years. While I understand that many AutoCAD users have a lot of catching up to do MicroStation has for a long time been the 3D choice of architectural practices like the Richard Rogers Partnership and Foster and Partners. While working for RRP in the mid 90s I modelled the Greenwich Millennium Dome in 3D using MicroStation SE and the whole project was designed, modelled and documented using a mixture of 2D and 3D with MicroStation. Furthermore, representatives from Foster and Partners have frequently given presentations detailing how they were able to use MicroStation to model buildings in 3D, in order to derive construction documentation that would have been impossible to conceive and realise any other way.

But you are right in that there is a cultural shift required by any organisation that is moving from an entirely 2D workflow to a partial 3D/2D workflow. This is another prime example of why the Bentley approach is right. Because our MicroStation platform provides the applications in our comprehensive portfolio with many innovations so the transition from a traditional CAD drafting workflow to BIM for example is easier due to interface and environment similarities. In fact it is fair to say that if you use MicroStation or PowerDraft you are already on the ramp to BIM.

MD: The benefits of an improved graphics interface and graphics pipeline appear to benefit 3D users. How will 2D customers see the benefits? Do you have any metrics on speed improvements? What does PowerDraft V8 XM gain on the graphics side?

JC: MicroStation PowerDraft is as its name suggests a derivative of MicroStation, as are Bentley Redline and Bentley View. All are hewn from the same code and all include many of the same innovations that first surface in MicroStation. In fact to be fair, MicroStation PowerDraft is possibly the biggest winner of the V8 XM Edition platform derivatives as it gains all of the new graphics subsystem and user interface updates as well as some of the other new features like Link Sets and PDF reference attachments. Remember also that MicroStation PowerDraft is not just a 2D drafting product – it too is a platform for the "Power series" which includes PowerCivil, PowerSurvey, PowerMap, PowerSite and PowerRebar. As such the MicroStation PowerDraft platform makes excellent use of its new architecture.

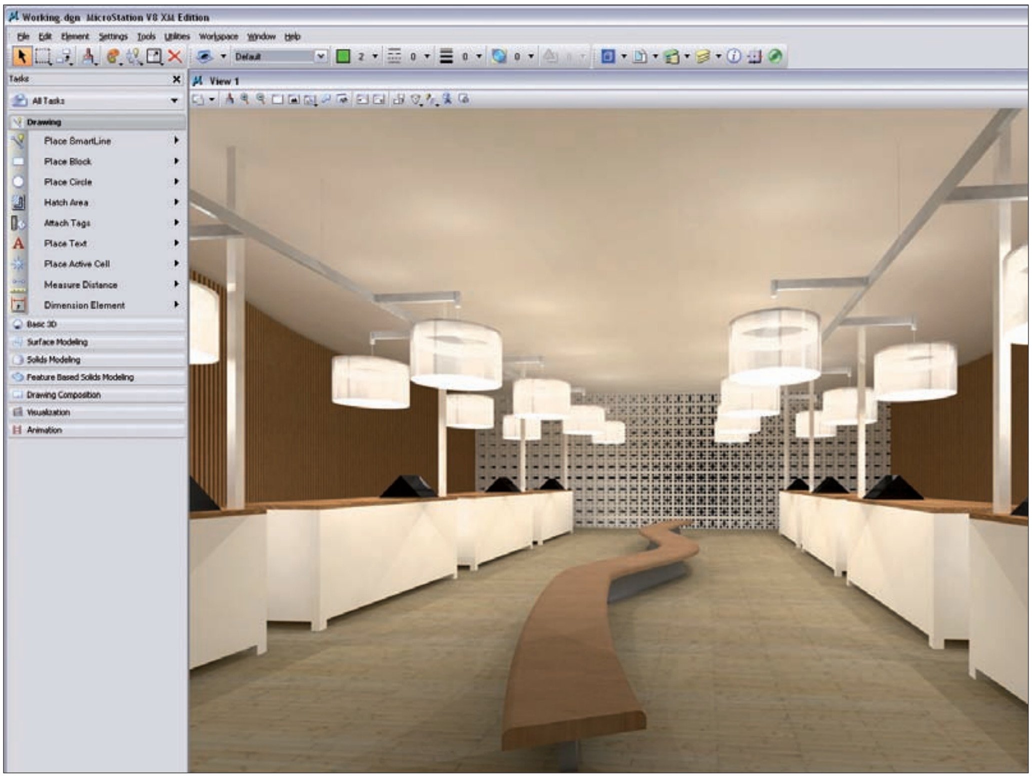
On the subject of graphics improvements, the key thing about the DirectX technologies is that it enables higher performance in graphics on your PC – regardless of the number of Ds! Remember, DirectX also controls low-level functions, including 2D graphics acceleration, so the user wins regardless. In the V8 XM Editions all platforms and applications benefit from measurably faster graphics by 250%+ which has opened the door to the inclusion of gradient fills and element transparency while still accelerating performance.

MD: What's next? MicroStation creates 2D and solids 3D geometry in a fairly traditional way. There have been a number of innovative applications like Sketchup and even now AutoCAD has learnt a thing or two in this interesting conceptual design area. While Bentley is certainly active in the high-end of geometry creation this with Generative components, but what is Bentley's opinion of the 'easy-to-use' conceptual modelling tools, and is it working on similar applications?

JC: To answer this question we come back to my earlier point made about the market trend towards specialised point solutions. Users are going vertical to increase their productivity and conceptual modelling tools are just one type of vertical application that an architect or engineer will turn to at a given point in their process. Users rightly demand the best tools for any given task and some of our users do indeed use Sketchup for conceptual modelling. Which is why we created our read/write interface between MicroStation and the Sketchup file format.

Users of MicroStation V8 XM Edition and associated applications can now make direct use of the Google 3D Warehouse to share 3D models using the Sketchup file format. Again proving that the greatest innovation by MicroStation is interoperability.

MD: Looking forward, there's a lot of buzz about the Microsoft Vista operating system, due out sometime next year. Was XM developed with Vista as the target system? Or was XP the target platform of choice? When people buy new hardware next year it will be difficult to find machines that don't come with Vista pre-installed. When will XM be available for Vista? Do you anticipate there be further graphics speed benefits in users moving XM to Vista?



JC: The MicroStation V8 XM Edition was designed to run on Windows 2000, and Windows XP. However, in parallel we have been testing its performance on Windows Vista and the early reports are excellent. As a Microsoft Gold ISV we work very closely with their development teams for many different projects – one recent and very successful example is ProjectWise StartPoint, our entry-level collaboration tool based on Microsoft SharePoint.

Of course the Vista development is another great example of our joint development efforts and we aim to release a SELECT update early next year with Vista Logo compliance. Based upon current testing and continued optimisation we expect the graphics performance to continue to improve. We are very pleased.

MD: Microsoft's drive behind DirectX, at the cost of OpenGL, has caused a lot of gossip in the graphics world. While OpenGL will see some sort of support in Vista, Direct X is seen by many as the way forward. You too have chosen to support DirectX. What were the arguments that persuaded Bentley to take this route?

JC: Clearly DirectX is the right technology to implement. DirectX integrates with all modern graphics cards and provides far superior vector and raster video speeds when compared to OpenGL. You only have to look to the gaming industry to see that OpenGL has a limited future. It really is a no-contest. I don't think that there is a gaming machine on the planet that is worth having that runs OpenGL.

"Clearly DirectX is the right technology to implement. DirectX integrates with all modern graphics cards and provides far superior vector and raster video speeds when compared to OpenGL."

MD: In a philosophical mindset, CAD used to drive a huge graphics market with expensive 2D and then 3D graphics cards and to an extent still does. This now seems to be handed on to the games market, which is pushing the enveloped of 3D worlds and performance. How much attention does Bentley's graphics development team look at the state-of-the-art in games to feed this through into MicroStation development. We are already seeing Bentley offer collaboration with virtual worlds like Google Earth, what kinds of graphics capabilities (outside the CAD area) are of interest now and could you highlight a few possible 'futures' for MicroStation's 3D capabilities?

JC: Wow. In development here we have people in one of two camps regarding their love for computer games. In the first camp we have developers that would happily play games all evening and then in the second camp we have developers that would happily play games all night! Joking aside, we have paid considerable attention to the way a gamer moves around their immersive gaming world and we have emulated the same ease of movement around 3D models with some new tools in the MicroStation V8 XM Edition. These tools have been implemented to make the transition from the immersive gaming world to the virtual BIM world simple.

As far as futures I do not want to share too much with you right now, there is a lot to take in already. Perhaps in another month or two I will have some news for you of further innovations by MicroStation. Let's reconnect then! ***www.bentley.com***

Max vs Maya

A 3ds Max user for ten years, Chris Hobbs, application specialist at CADline, recently started using Maya. But which is the right product for in design visualisation users?



'Element Condominium' ***created in Maya and courtesy of Alpha-Vision (www.alpha-vision.com)***

3ds Max is a product that has been under the Autodesk umbrella for many years, since the acquisition of the original development company, Kinetix. During the intervening years it has been traded under the company name of Discreet, which has itself been reabsorbed into Autodesk as the Design Media and Entertainment department.

Maya has been owned and developed by a company called Alias which was acquired by Autodesk earlier this year, making Autodesk the market leader in modelling and animation.

Positioning

I have searched high and low to find a definitive message on how these two products sit within the Autodesk portfolio and in this article I will attempt to simplify it, or at very least try and aim you in the right direction.

With any major software acquisition the same questions reverberate around the industry; ***"Why has Autodesk acquired Alias?" "Surely Max is in direct competition with Maya, don't they do the same thing?", and ultimately, "Has Autodesk bought Alias to shelve Maya, or even replace Max?"***

In the main, they do perform many of the same tasks; they can model, render, animate and create a headache for most IT departments! They do have their subtle differences and as with most competitive products, they have their strengths and weaknesses.

The straight answer to the last question is neither. Those of you that keep an eye on such things will be well aware of the precedence set with the purchase by Autodesk of the Revit Corporation five years ago. For those of you that haven't heard of Revit, it was a product that was in direct competition with Architectural Desktop in the architecture and construction market. Autodesk acquired the software and has been developing them in parallel, with no intention of shelving either product. They have taken ideas from each and shared them with the other, improving both products. The differentiation that has emerged has been one of mindset rather than feature list. This is something that I am sure we will see happen to Max and Maya.

After spending the best part of 10 years using



'Epic Condominium' ***created in Maya and courtesy of Alpha-Vision (www.alpha-vision.com)***



'One Time Square' *created in Maya and courtesy of Alpha-Vision (www.alpha-vision.com)*

Max in various industries I have now started to use Maya and have found a lot of similarities in the way the products work. In Max we use the transform gizmo to move, rotate and scale an object, a function that is mirrored by a similar tool in Maya. Right clicking an object in both products will produce intelligent sub-menus that are only relevant to the selected objects. I find using Maya very familiar, with some features in which I still prefer the Max approach, whilst in others I find the Maya approach a refreshing improvement. Both products are now using Mental Ray as the secondary rendering engine.

Technical comparison summary

Max has become extremely popular in both the architectural and visualisation industries, an approximate sales split in these industries compared to Maya is around 80/20. In the games and TV/Broadcast industry it's about 50/50 and in the Film industry it's about 80/20 in Maya's favour.

'Trump Fort Lauderdale' *created in Maya and courtesy of Alpha-Vision (www.alpha-vision.com)*



Max has advantages over Maya with regards to the architectural and visualisation markets in terms of conceptual modelling tools, low-level polygonal modelling (vital for real-time applications), large scale environment creation (level edits, AEC scene visualisation), as well as interoperability with other Autodesk product lines. In the gaming, TV/Broadcasting areas Max has strengths that include 'out of the box' character rigging, motion capture handling, and animation layering.

So what are the strong points of Maya? Well, after a relatively short period of becoming acquainted with Maya, I would be inclined to say that its main strength lies in NURBS modelling. Although Max can adequately model NURB surfaces, it is quite hard to use and so most MAX users rely on 3rd party products for surfacing. Maya has a different approach to NURBS modelling which seems to flow much easier than Max, and if asked to make a comparison with anything, then I would say it is closer to the tools and approach of Rhino. For those of you unfamiliar with NURBS, they are potentially complex surfaces that have a very low face count. For example, create a sphere using polygons and in making it smooth you might end up with over 100 faces. By using a Nurb Surface to create the same shape you are only dealing with a single face.

Maya is also known for its fluid effects. This element of the software will allow the user to realistically simulate how fluids and gasses would react in real world environmental conditions. The type of effects that can be achieved are pyrotechnics such as fire, explosions and nuclear blasts; space including clouds, steam, mist, fog, smoke; and viscous effects which include molten lava and mud. The fluid effects also include an Ocean Shader for creating realistic open water and we can see how objects would look and react when floating or sinking. The closest weapon in the Max arsenal is the Reactor tool, which is good in some areas of object interaction but not as effective at fluid dynamics.

Ancillary advantages include the advanced character rigging in Maya which will allow the user to totally customise the rig in a much easier way than achieving the same result in Max.

Maya has a great tool called Paint Effects which will allow the user to draw free-hand on a surface; the software will add a 3D paint effect and there are plenty of effects that come standard with the software ranging from grass through to neon strobe lighting. The tool makes seemingly complex and impressive after-effects very quick to achieve.

Maya will also run on Windows, Mac, and Linux platforms whereas Max is only available for Windows based systems. Maya's latest incarnation - release 9 - is 32- and 64-bit, as is 3ds Max Release 9.

Conclusion

So getting back to the original question, 'Which product is right for me?' If you are in the Architectural and Visualisation industries then I would still say Max is the right tool. However, if your software budget can stretch far enough, then I would also suggest purchasing a seat of Maya. Maya has some great tools that will propel your visuals to a cut above the rest. Using the paint tools, and fluid effects, your walkthrough can become hugely more realistic. Imagine creating an animation with a pond in the background that is rippling around a floating object, or water trickling down rocks, these are the kind of things that can be achieved using Maya.

www.cadline.co.uk









Gallery

Preconstruct

Project: Swansea Leisure Centre

Forming the centrepiece of a £25 million project to revitalise Swansea's Leisure Centre in 2008 will be Europe's first indoor surfing centre. The revolutionary Surf Stream, which will bring all the thrills of seaside stand-up and bodyboard surfing indoors, will be part of a new 21st century water park which includes a network of indoor pools, slides and waves.

The leisure centre will also boast a multi-purpose sports and exhibition hall for sports, conferences and exhibitions, concerts and a synthetic ice rink. Outside, the leisure centre's exterior will also be given a facelift by replacing the old concrete panels with clear glass, translucent glazing and timber panelling.

Powell Dobson Architects enlisted the help of leading design visualisation specialist, Preconstruct, for the delivery of twelve stills and a DVD featuring four minutes of animation. The aim was to communicate the proposals to council members, business leaders and the general public.

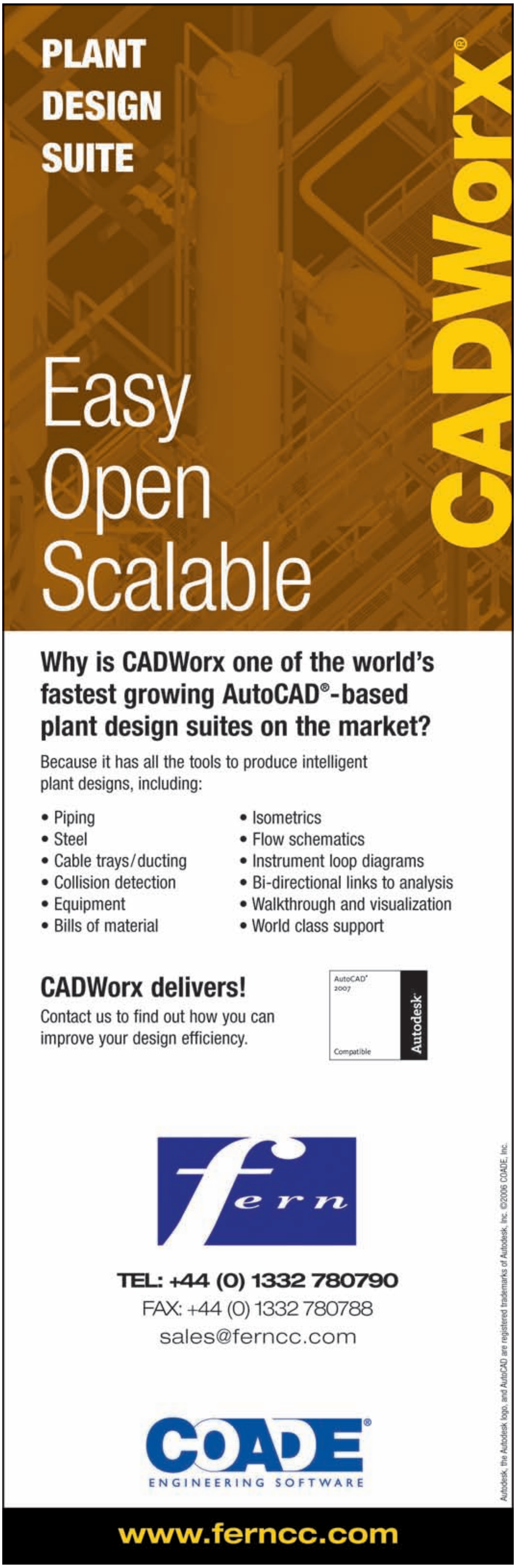
Preconstruct received 3D DWG files from Powell Dobson and repurposed them for use inside 3ds Max. Due to the tight project deadlines stylised 'ghosted' characters were used in both stills and animations but we, at AEC Magazine, think the results are extremely effective. The animation can be viewed online at www.aecmag.com.

Preconstruct uses Dell dual Xeon workstations with Nvidia Quadro FX graphics cards. VRay was used for rendering with the load spread across a cluster of 15 dedicated workstations.

www.preconstruct.com

*Go to **www.aecmag.com** to see the Swansea Leisure Centre animation which accompanies this project.*




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Medical attention

For the redevelopment of Derby hospital, Skanska required a single document management system for the delivery and ongoing management of the building. Skanska found the perfect solution in BuildOnline's On Demand software.

In every redevelopment project it undertakes, Skanska is responsible for meeting, and ideally beating, the aggressive targets set for the delivery of each stage of the project. The risk if it fails to do so? High financial penalties and reputation loss. The company's project team, therefore, must always work together to reduce delays and errors. When it won the contract to build, refurbish and manage Derby Hospital, as part of a 35 year PFI contract, collaboration was the buzzword of the team. How to collaborate better was the next question.

To meet the programme's deadlines, Skanska, Derby Hospitals NHS Foundation Trust and every partner in the supply-chain, needed to be able to effectively communicate with all parties. Common processes were required to manage version control of documents, requests for information, the approval process and the management of defects. An audit trail of all processes needed to be easily accessible so that all decisions were recorded and people were accountable for their actions.

Skanska had to look at a long-term approach to working practices and partnership. One key decision factor when looking into partners and providers was how documentation and information used in the construction phases could be made easily and readily available to the construction team. Equally, the facilities management teams needed access to be able to properly manage the services across the whole life cycle of the PPP.

BuildOnline solution

After reviewing the market and various providers, Skanska selected BuildOnline's On Demand Document Management and Collaboration software.

The solution provides the Derby Hospital project team with a powerful document management system and a means to manage all project processes including information requests (RFIs) and document approvals in one central location.

This is accessible to all members of the team regardless of their location or role in the project. Documents can be uploaded and downloaded, but in a controlled environment whereby version control ensures that users are always accessing the latest, and most importantly the correct, version. Action history relating to any document can be viewed, including who has downloaded/uploaded/viewed it, with a date stamp.

Previous versions can also be viewed if required. During the course of the project, the design and



construction team benefit from such functionality, while the FM team can be sure all the right documents are stored in one central location, throughout the lifecycle of the project.

Skanska has a series of offices at the hospital site from where the day-to-day works are managed. The project team including subcontractors need hard paper copies of drawings to operate and use BuildOnline's integrated 'Reprographics' module. The software allows users to send requests to their nominated local reprographic house. The print houses access the documents in BuildOnline with a cover sheet detailing quantity, size, format, recipients and invoice details.

As BuildOnline's technology is available on demand, Skanska has been able to 'switch on' extra product modules as and when the project dictates, ensuring that costs are kept low, but the technology is available quickly. The most recent functionality made available to the project team is the 'Defects Management' module, which allows the site team to better manage the reporting of defects, which has traditionally been very labour-intensive. This means that Skanska can now effectively track progress and the subcontractor responsible for the fix can manage multiple requests electronically through BuildOnline. Equally, project managers can review who is behind schedule and which jobs are outstanding.

Skanska had experience of BuildOnline's software throughout the supply-chain so they were confident that adoption would be rapid and successful. To assist, BuildOnline's implementation team worked closely with Skanska to produce a training programme, online user guides and training manuals for all users. The software's ease of use and the support available has ensured that adoption of the software has been high across the project team.

Skanska will be using BuildOnline to collaborate on the building, refurbishment and ongoing management phases of the Derby Hospital project.

"At Skanska, we are not only responsible for construction work but also the hard facilities management contract to manage the buildings and their operations for the next 35 years," explained Martin Quaid, Project Director, Skanska. "The use of a single document management system is vital for the delivery and ongoing management of the hospital. BuildOnline's On Demand software has the functionality to manage our wide remit, whilst its ease of use ensures that our supply-chain can swiftly embrace the software."

Business benefits

Almost 40 companies and 250 users are managing 14,000 documents using the BuildOnline solution for the Derby Hospital. The project team uses both the document management system and the workflow processes available to ensure that all areas of the project are on track.

BuildOnline's software has enabled the project team to work together more effectively, meaning that time savings are being seen at every stage in the process. Combining all these gains has also lead to significant cost savings for the project.

One such area was the management of documents. On a similar size project where Skanska was not using BuildOnline's On Demand software, the project was employing 10 document controllers. In stark contrast, the Derby Hospital project needed only two document controllers, managing the documents and data using BuildOnline and resulting in an 80% saving for the project.

Plans for the future

Skanska will continue working with BuildOnline for the lifetime of the project - liaising and working closely together to ensure that the new functions of the technology are used where appropriate and that the project team continues to make the most of the technology in their day-to-day jobs.

"Skanska recognised the need for a system that would enable us to manage information and collaborate with our supply chain and interested parties. We selected BuildOnline because of its easy to use product and exceptional levels of service," concluded Quaid.

www.buildonline.com

CADS RC 9 preview

Hundreds of Consulting engineers, contractors, and rebar fabricators throughout the world have been using CADS RC for many years. Greg Corke got an exclusive preview of the latest release, which brings the mature RC detailing product bang up to date.

CADS RC is the flagship product in the portfolio of Poole-based structural software developer, CADS. The AutoCAD-based detailing software is used worldwide on a diverse range construction projects, including those in North America under the RebarCAD brand.

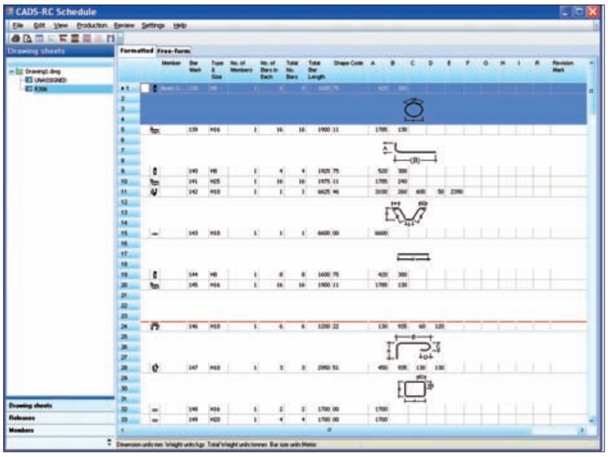
CADS RC offers a powerful set of standard detailing tools, together with a bar scheduling database which updates automatically if your drawing changes – everything you'd expect from a modern structural software solution. The system also includes automatic RC detailing Macros for beams, pile caps, bases, footings and padbases.
In addition CADS RC links to CADS' Finite Element Analysis and modelling tool Smart Modeller, which enables slabs to be designed and detailed automatically, and results obtained from the company's BS8110 design programs for beams, columns, bases, etc, can also be imported into CADS RC for instant detailing and scheduling.

It's been over five years since the last major update to the product - a long time in software development terms – but CADS has continuously developed version 8 introducing support for new countries, the latest BS8666 bar bending code and AutoCAD 2007 support. In Q4 of 2006 CADS is set to launch the much anticipated Version 9. Usability is high on the list of improvements for this new release - which marks the first stage of a major system rewrite - but rather than focusing on enhanced methods of drafting, CADS has concentrated its development efforts on making the downstream RC detailing processes much more efficient. This means a major overhaul to the scheduling interface, a more comprehensive issuing and revision system and the streamlining of report generation, among other features.

On schedule

At the heart of the new version is a brand new Scheduling Interface, which runs in an entirely separate window to AutoCAD. As users draft their details inside CADS RC, the Schedule is updated automatically. This makes the program ideally suited to a dual monitor workstation setup where users can easily keep track of both sets of information at the same time.

Programmed in .NET the new Scheduling Interface replaces the previous AutoCAD-based dialogue box of V8, which looked dated and was not particularly intuitive when it came to viewing or organising the contents of the bar bending schedule.



The new Scheduling Interface makes it much easier to organise, categorise or format your bar data.



Based on modern GUI standards, the new interface takes inspiration from programs such as Microsoft Outlook which makes it much easier to organise, categorise or format your data. At the click of a button, users can easily group data by bar marks, bar length, type or size and 'Free Form' queries are equally simple to carry out. For example, you can find out how much of a particular shape or type of steel is used in an individual drawing.

Much attention has also been paid to the customisation of the Scheduling Interface and CAD managers can easily format which fields are visible, where they appear and how they are displayed. Version 9 also makes it much easier to create reports, which are based on standard templates, but can also be fully customised by the user.

Users can of course still place schedules inside a CADS RC drawing. This has also been enhanced for Version 9 and uses AutoCAD's new Table command so users have control over spacing, font, size, etc. Any update made to the drawing will be automatically reflected in both schedules.

Finally, it should be noted that unlike brand new software platforms like Autodesk Revit, you can't make changes to the schedule in order to update the drawing – for the time-being the associativity between CADS RC drawing and the Schedule only works one way.

Issuing and revision

To help cope with increased time pressures on RC detailers to deliver drawings and schedules as soon as they are finished, the new version enables users to issue in stages, whilst managing the process at the same time. This means several drawings and their associated schedules can be detailed in one AutoCAD DWG file.

A drawing sheet can either be an AutoCAD layout or a specific area of model and as soon as a sheet is finished it can be issued. CADS RC then locks out the drawing and associated schedule, until such a time that a revision is required.

The use of drawing sheets also makes it very easy to copy and paste between viewports with different scales, and the continuity of bar marks is also managed effectively.

If a revision is required at a later stage, CADS RC will automatically put a red 'Revision 'A' cloud' around the bar in question, add a note to the revision section of the drawing's title block and update the schedule. Any subsequent revisions will be automatically marked 'Revision 'B', 'C'' etc.

To finish off the process, RC detailers can also export to SteelPac in order to automatically generate code for cutting lengths and bends. Other export formats also include Steelpac, Pinnacle, Ariadis, CSF, PDF, Excel, etc.

Conclusion

The introduction of CADS RC 9 marks the first stage in what will be a complete overhaul of the popular RC detailing solution concluded with release 10. The major concentration in this release is on the management of the RC detailing process with critical updates to the scheduling interface and a streamlined issuing and revision system. Together, these enhancements should lead to less manual checking downstream, which is a critical factor in the success of any Computer Aided Design software solution.
While CADS introduced some impressive functionality for dealing with Over Stock lengths in version 8.4, there has been little added to CADS RC in this release in terms of how details are drafted. This is all to look forward to in future updates, which when implemented is sure to add further value to an already impressive RC detailing system. ***www.cads.co.uk***



Getting ready to get it right

CAD and/or GI requirements remain one of the more frequently overlooked aspects of a project scope, in terms of resources, budget and time. Yet experience suggests that the more such specialists are consulted, the more likely it is that customer expectations will be met, says James Cutler, eMapSite

In this article, starting from the view that geographic information is critical to the success of a project, we aim to stimulate all participants in projects involving location and using Geographic Information (GI) (as they nearly all do now) to play an active part in delivering business value. The issues raised are relevant to GI and CAD but also to business factors and will result in greater value being attached to the role and contribution of GI expertise.

Playing your part

Regardless of your technical acumen there are common roles and practices that apply to most projects. From the smallest one-man contractor business to the largest enterprises, projects are undertaken by people with different skill sets and foci, each of which contributes in a particular way to the design and outcome of the project.

Individuals can be guilty of viewing projects in terms of their own core skill set or interest rather than from a wider perspective, that of the end user/client/customer/stakeholder. As this implies your end user may at one level believe that you are the experts while at the other end of the spectrum may think that they know everything and you are a mere lackey, so it can be a sensitive task to ensure that the deliverables meet their expectations, within budget, on time and to their advantage!

CAD and/or GI requirements remain one of the more frequently overlooked aspects of a project scope, in terms of resources, budget and time. Yet experience suggests that the more such specialists are consulted, the more likely it is that customer expectations will be met.

Early project stages should identify factors affecting the outcome, deliverables and effectiveness of the project. Such needs assessment should not be restricted to functional issues and must take into account data, personnel and institutional factors. The evaluation, analysis and management of geospatial data necessarily lies at the heart of projects involving geographic information. These elements need to be accommodated or addressed within the design and/or data assimilation stages and thus enable sustainable solutions to be implemented and expectations met.

Requirements and expectations

On the data side in particular evaluating the following factors in the context of project and institutional objectives is essential:

A adequacy (quality, integrity, age/currency, frequency, accuracy, coverage, completeness, reliability, sustainability, consistency, timeliness, scale, resolution, collection, sampling methods etc.)

B accessibility (method of distribution, cost, copyright, royalty, format, metadata, acquisition, delivery etc.)

C sustainability (maintenance, interoperability, security, resilience, software upgrades, compliance,



scalability, user authentication, monitoring, documentation, back-up procedures, retention of staff etc.)

A convenient if not entirely accurate classification of the above would assign responsibility for adequacy to the data producers (including surveyors, quality control teams, CAD and GI personnel), responsibility for accessibility to project managers (whether or not they encourage the adoption of processes herein) and responsibility for sustainability to system managers and administrators. In some cases these may be one and same person(s) expediting the path to effective implementation.

Accessibility and sustainability tend to be more operational or institutional factors but ones that are no less important in affecting project or organisational objectives.

Focussing on data adequacy, any evaluation of geospatial data will first consider the purpose for which the data is to be used. In instances where data is still to be collected this will ensure that data is collected at an appropriate scale and according to a suitable sampling methodology to the accuracy and precision required. Where data already exists it should be reviewed through the filter of these factors.

This process is intrinsic in ensuring that adequate time, resources and budget are allocated to the preparation of the digital data baseline and for its enhancement during the project.

The quality question

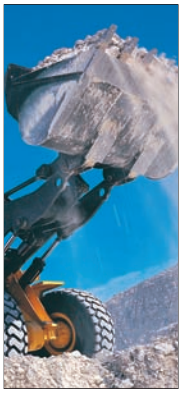
It may of course be pertinent to embark on some quality control to test the integrity of the data and associated metadata in relation to the adequacy of the data for the proposed task. This is certainly the case with digital mapping where modern systems allow infinite levels of zoom display, measurement, analysis, reporting and output. All project members need to be aware of and understand the risks from abuse of the restrictions that the scale of the source data places on what can be done with it.

Quality assurance (QA) is a set of approaches that is consciously applied and, when taken together, tends to lead to a satisfactory outcome for a particular process. A QA system based on these guidelines will employ documented procedural rules, templates and closely managed processes into which various checks are built.

Errors in data capture (often referred to as RMS errors, a statistical measure of accuracy) and other metadata can appear arcane to many but few in the CAD and GI community would fail to recognise their role in achieving valid end results. And it is this requirement that fuels additional primary data capture requirements – more site survey, more detailed sampling, sub-surface survey, terrestrial photogrammetry, 3D modelling etc.

Issues to look out for in quality control of geospatial data include:

- Survey precision
- Digitising precision
- Geometric accuracy (RMS error within data)





- Geocoding accuracy and currency
- Accurate recording of source material including date
- Conformity with standards, for example BS7666, W3C Accessibility, OGC WMS

The flip side of this consideration of primary data sources is consideration of the suitability of off the shelf data for the task at hand (bearing in mind that most carries with it some caveats regarding fitness for specific purposes).

For example, OS MasterMap is a seamless geographic data base (map) for the whole country but this does not obscure the fact that some areas are surveyed at different tolerances from others, commensurate with perceived user requirements. The emergence of the renewables sector now means that some of the country's remotest places, traditionally surveyed at 1:10,000 scale, are under the microscope for 3D modelling, temporary route alignment, ZVI and more. Users familiar with OS MasterMap for urban planning are well-advised to recognise the limitations implicit in using OS MasterMap to undertake the same activities for wilderness areas!

Thinking about existing data

Additional issues to be aware of that reflect well in business processes:

Duplicate data sets

Do they exist? If so, is the license valid? If so, is the data of appropriate quality bearing in mind that outwardly similar geospatial data with identical content (attribution) may have been acquired for different purposes using different scales, accuracies, sampling procedures and licensing. This may (or may not) impact their use for a third purpose for example through incompleteness.

Sharing

Institutions are rightly proud and protective of their digital data as it represents a considerable investment of time and resources. Some of the value of such data lies in the information that can be derived from that data by users who combine different data sets to extract new information of use in various aspects of planning, management and decision- making. Offering visibility of such data across the enterprise creates an internal market while scope exists, for example through use of and compliance with OGC Catalog Services to open up the data to third parties for commercial gain.

Harmonisation

Since the dawn of GIS (and IS in general) different schools have sought to build strong brands through proprietary formats and processes or through open standards. The efforts of the W3C and the OGC mean that most major GIS and business systems do directly or through third party tools support the vast array of geospatial formats in the market place. At the very least this obviates the need for software standardisation and increasingly contributes to the adoption of web services and browser based solutions free of licensing costs.

Risk, hidden cost and professional integrity

There are many ways to cut corners in acquisition of geographic information, over which GI stakeholders can have influence in project design:

- Old map data
- Out of license data
- Scanned data (out of date, out of license, distorted, entailing extra man time to correct)
- Small scale data
- "Screen scraping" (for example of the author's own webpages or those of MultiMap, StreetMap, Google and others)
- Data re-use (for example, in same or overlapping area – license and currency issues)
- Data sharing (as above)

Use of third party material either directly or as a source for deriving your desired information (aerial photography, satellite imagery, scanned maps -all carry licensing and currency risks)

The so called "grey market" from these activities is believed to be worth some £10-£15m per annum in lost royalties to the intellectual property rights (IPR) holders (less than a fraction of a % of the value of land and property related business in the GB each year), a fact not lost on them or their legal teams as for example recent court cases by Ordnance Survey (vs. the AA) testify.

Self-evidently digital geographic data are not "just" lines on a map, appearing out of the ether and lasting in perpetuity through all the changes wrought on the landscape and the IPR holders invest continuously in their products to maintain their value and fitness for purpose. For the user factors such as professional integrity, risk mitigation, service differentiation and quality management systems increasingly mean that enterprises large and small set great store by the transparent, compliant, efficient practices and processes across their operations, including legitimate use of intellectual property.

Conclusion

Firstly, avoid being a nay-sayer and doom-monger! There will always be a few ostriches who will want to ignore opportunity cost and insist that "it" can be done for less. Instead focus on the customer, their expectations and the business case for an approach that is cognisant and inclusive of the need for and role of geographic data. Hopefully, budgets, resources and timeframes will flex in recognition of your insight and value!

This article was written by James Cutler, CEO at eMapSite, a platinum partner of Ordnance Survey and online mapping service to professional users

www.emapsite.com

Workstation reviews

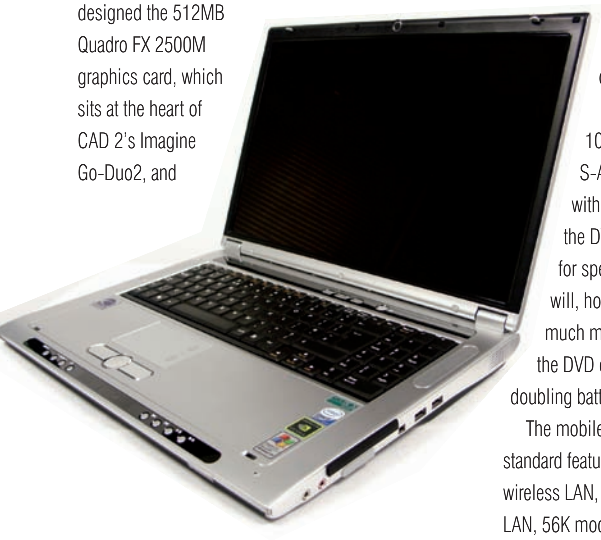
Intel is back with its impressive new generation processors. From mobile workstations to high end desktops, Intel's Core 2 Duo and Xeon offer something for everyone. This month we look at machines from CAD 2, Scan and HP.

CAD 2 Imagine Go-Duo2

In the last issue of AEC we looked at Woodcrest, Intel's latest desktop Xeon CPU, which is a derivative of its new mainstream processor, the Core 2 Duo. In this month's magazine we see the Core 2 Duo go mobile courtesy of technical workstation specialist, CAD 2, who has just launched its first Core 2 Duo mobile workstation, the Imagine Go-Duo2.

Codenamed Merom, Intel's new mobile EMT64 dual core processor is remarkably similar to its desktop counterpart - the main difference being the speed of the Front Side Bus (FSB) and the maximum clock speed, which peak at 667MHz and 2.33GHz respectively with the T7600 model, featured in our test machine.

While the slower FSB is due to compatibility with Intel's previous generation Mobile 945 Express, the reduction in clock speed is designed to limit power consumption to around 30W. This same regard for battery life was not given by Nvidia, however, when it designed the 512MB Quadro FX 2500M graphics card, which sits at the heart of CAD 2's Imagine Go-Duo2, and draws up to 100W of power.



While this limits the amount of time you can work away from a power outlet, it does mean you have an extremely powerful 3D graphics card at your disposal.

In terms of memory, the test machine was kitted out with 2GB of DDR-2, but can take a maximum of 4GB. As the Core 2 Duo is a 64-bit processor, those running Windows XP x64 Edition and compatible applications will now be able to work with models over 2GB in size when they're on the move. CAD 2 will be able to support this Operating System once Nvidia ships its mobile 64-bit graphics drivers.

The 17 inch TFT has a native resolution of 1,920 x 1,200, which is great for maximising the amount of CAD data you can fit on the screen but can make it hard to read small text and icons, though third party software can improve this. The screen also has an X-Black finish, which makes black more black, colours brighter and image quality arguably sharper. Some love it and others hate it. In this instance I'm one of the others as I find it far too reflective under certain lighting conditions, but a matt finished display is also available as an option if you so choose.

The test machine shipped with a 100GB high performance 7,200RPM S-ATA drive. This can be supplemented with another S-ATA drive at the expense of the DVD drive and configured in a Raid 0 array for speed or Raid 1 for fault tolerance. This will, however, put further load on your battery. A much more effective move would be to replace the DVD drive with a second battery, in effect doubling battery life.

The mobile workstation is kitted out with all the standard features including integrated high speed wireless LAN, Bluetooth, 4x USB 2.0, Firewire, Gigabit LAN, 56K modem, serial, IrDA & PCMIA. Less standard features include a 4 in 1 digital memory/smart card reader a 1.3 Mega Pixel digital camera and a DVI output to connect to external TFTs or digital projectors. For true mobile connectivity, there's also a 3G Internet Option, which is fitted in the internal mini-pci socket.



The keyboard is excellent, firm and responsive and features an extremely useful numerical keypad. I was less impressed with the touchpad which often missed my double clicks, though serious CAD users would most probably be using an external mouse.

At 3.76kg CAD 2's Imagine Go-Duo2 is not the lightest notebook you can get your hands on, it's unlikely to win style awards, and battery life for 3D CAD isn't great unless using two batteries, but it certainly doesn't disappoint when it comes to raw processing power. It's up there with most desktop workstations and for the first time gives mobile users access to the full extended memory benefits of 64-bit environments, and with growing model complexity high-end CAD users who spend time away from the office are sure to take notice.

www.cad2.com

Specifications

CAD 2 Imagine Go-Duo2

- Intel T7600 Core 2 Duo 2.33GHz processor
- 2GB of DDR-2 memory
- Nvidia Quadro FX 2500M graphics card (512MB)
- 17 inch X-black TFT (1,920 x 1,200 resolution)
- 8 x DVD-RW drive
- Windows XP Professional (32-bit or 64-bit)
- £1,945

Scan 3XS workstation

Nearly ten years ago we reviewed a workstation that had a mini refrigerator bolted onto the bottom and was used to pump coolant direct to the CPU in order to take the heat out. This was the nineties and overclocking was all the rage – cranking up a CPU by 50MHz or so was the closest thing to heaven for some PC enthusiasts.

While the extra GHz did make a significant difference to performance, the process of taking out the additional heat produced by overclocking this machine came at the expense of peace and serenity. Fridge pumps are noisy and this one was no exception.

Fastforward to 2006 and while overclocking is still prevalent in gaming circles, it is the reduction of PC noise that is now receiving widespread attention. All the major workstation vendors are addressing this problem with custom-built ductwork and large low duty fans, all designed with high-tech Computational Fluid Dynamics (CFD) computer analysis - and the results are very impressive.

Bolton-based Scan has taken a very different approach to cooling for its latest 3XS workstation. In search of the near silent workstation, the company has turned its back on fans and looked to cutting edge water cooling technology from a company called Alphacool. The system works by pumping water around your workstation through a network of plastic tubes. The water gets right to the heat sources; with individual cooling units bolted straight on to the CPU and graphics card, (which has had its standard heatsink and fan removed). The hard drives are also housed in individual cooling caddies. The water is then routed to a radiator, which is mounted on the case exterior and takes all the heat out of the system.

It's all very impressive to watch and more importantly unbelievably quiet, but what you really want to know is what exactly is the Alphacool system keeping cool? In terms of components, Scan's latest 3XS workstation is built around Intel's Core 2 Duo E6600 2.40Ghz processor, with an Nvidia Quadro FX 1500 delivering the 3D graphics, and two Samsung Spinpoint hard drives providing over 600GB of storage. An ASUS P5B Deluxe motherboard sporting 2 x 1GB DDR2 memory DIMMs ties the system together. Collectively, these components deliver truly excellent performance across a range of 3D CAD applications, and when you consider the price of the machine this is even more impressive.

So what's the verdict? If you showed me this system a year or so ago, I would have been bowled over as it is without doubt the quietest machine I have ever used. However, fan technology has also moved on leaps and bounds and there are now a number of extremely quiet workstations out there which use more traditional cooling technology.







Specifications

Scan 3XS workstation

- Intel Core 2 Duo E6600 (2.40Ghz) (dual core)
- 2 x 1GB DDR-2 memory
- ASUS P5B Deluxe (Intel P965 Chipset)
- Nvidia Quadro FX 1500 graphics card (256MB)
- 1 x 250GB Samsung Spinpoint 7,200RPM hard drive
- 1 x 400GB Samsung Spinpoint 7,200RPM hard drive
- Alphacool cooling system
- Microsoft Windows XP Professional
- £1,599 (£1,299 with standard fan cooling)

My Mum always told me that water and electricity don't mix, and while the system feels extremely solid, I would question how resilient the system is to leakage from knocks. My other concern is that Nvidia's three year warranty will be invalidated by removing the fan and heatsink from its Quadro FX graphics card, though Scan admirably says it will honour this, despite offering a standard one year guarantee on the rest of the machine.

Those with similar concerns will be pleased to hear that the same machine is also available with standard fan technology, which from testing previous Scan workstations will still make your machine extremely quiet. However, if you're looking turn heads with what could rightfully claim to be the quietest workstation in the world, then look no further.

www.scan.co.uk

HP xw6400

Big performance usually means big computer, but this cannot be said of HP's new xw6400 which is the smallest dual Xeon-capable workstation we've ever seen – smaller in fact than most single processor machines.

Despite having capacity for two Xeon 5100 series processors, our test machine was only kitted out with a single Xeon 5150, which runs at 2.66 GHz, and features a 1,333 MHz FSB and 4MB L2 cache. As all new generation Xeons are dual core processors in their own right you still get two physical CPUs in your machine, which will be more than sufficient for most CAD users. At this stage in CAD software development, dual Xeon processor (quad core) workstations are only really likely to benefit those who perform complex multi-threaded calculations, such as those for rendering or analysis.

Despite its sleek compact chassis, the xw6400 is an incredibly quiet machine and we hardly noticed it crunching its way through our suite of compute intensive CAD applications. The CPU performance is excellent and while the 5150 processor is not the fastest in Intel's new generation Xeon family, it still provides a huge step up from previous generation processors, and a smaller, but still sizable improvement over AMD's Opteron 1000 Series.



The Xeon 5150 is coupled 4GB of DDR2 SDRAM which maxes out the available memory under standard 32-bit Windows XP and still gives a little room to grow in the future if moving to 64-bit Operating Systems. The test machine shipped with 4 x 1GB DIMMs, but the 2 x 2GB DIMM option would give room for expansion as the machine only has four memory slots. 4GB DIMMs will also be available very shortly, giving the machine a maximum of 16GB.

Nvidia's 256MB Quadro FX 1500 graphics card provides excellent 3D performance across a cross section of CAD applications, and the 73GB SAS (Serial Attached SCSI) offers lightening quick response, but at the expense the huge capacity that S-ATA drives now offer.

The xw6400 is a truly excellent dual processor capable machine, which offers all the performance benefits of a high-end workstation, without the size or noise usually associated with such machines. It does lack the expandability that a true high-end workstations offer, such as HP's new xw8400, which can accommodate up to 32MB of RAM. But with this particular test machine you still have option of adding a second processor, which could become more beneficial in the new year with the arrival of Microsoft Vista.

www.hp.co.uk/workstations

Specifications

HP xw6400

- Intel Xeon 5150 (2.66 GHz) (dual core)
- 4x1GB DDR-2 memory
- HP motherboard (Intel 5000X chipset)
- Nvidia Quadro FX 1500 graphics card (256MB)
- 73GB SAS hard drive
- Microsoft Windows XP (32-bit or 64-bit)
- £2,245

HP DesignJet 4500

A few years back HP's large format DesignJet printers were just that – large format printers. Now with the DesignJet 4500 series, the company has added a range of technologies to streamline production as well as raw print speed.

Over the past decade HP has transformed the large format inkjet printer from a machine that delivers one off colour line plots, to one that is capable of delivering full colour in a production environment. The DesignJet 4500 is the latest printer in this evolution and combines lightning fast printing, a huge capacity for unattended operation, and a set of impressive remote management tools. Integrated copying is also available with a standalone scanner and for the first time HP offers an optional stacker. It's a very impressive workhorse system, so let's take a closer look at the technology behind it.



HP DesignJet 4500mfp, which includes a wide format scanner, plus optional stacker.

Print technology

At the heart of the DesignJet 4500 is a new print technology called Double Swath. Put simply this means that the machine uses two print heads for each colour (Cyan Magenta, Yellow, Black), which nearly doubles the printable area in each pass, and as a result the speed of printing. To accommodate this increased printing zone (which at 6cm, is double that of traditional wide format printers) HP had to develop a vacuum system, which works in conjunction with the media feeding system to ensure accurate delivery of the paper. Sucking the paper down not only means that the paper is held in place as the print heads pass over the print zone, but ensures that the media does not expand when it takes in ink. This is particularly critical when working with plain paper.

The main benefit of doubling the size of the print zone is of course a huge increase in print speeds. As a result, the DesignJet 4500 is able to print an A1 line drawing in an extremely impressive 25 secs. While you won't get this performance at the maximum resolution of 2,400 x 1,200 dpi, print quality is still impressive at lower settings.

While raw printing speed is hugely important, so is the processing time required prior to printing, and for some this has been a major bottleneck with some previous DesignJet models. HP dramatically increased this processing speed with the DesignJet 4000 and now with a faster processor the DesignJet 4500 takes this a step further. The machine ships with 256MB as standard, but can be expanded to 512MB. This will be of particular interest to for those printing full colour graphics.

Network printing

The DesignJet 4500 plugs into a standard Ethernet port and appears as a network device. Most jobs will be sent with the standard Windows print driver installed on each client computer, but there's also a dedicated AutoCAD driver available to provide greater control over pen settings etc.

The standard driver includes an impressive print preview capability which enables users to zoom and pan around their print before it's sent. Jobs can also be submitted via any standard Web Browser in formats such as TIF, JPG, PDF, and HP-GL/2, and these are processed on arrival.

In addition to job submission, the DesignJet's Embedded Web Server provides a full set of remote print management tool accessible from anywhere in the world using a standard Web browser. Users can remotely monitor printer, ink, and media status and usage and email alerts can also be provided when consumables are getting low. Multiple files can be submitted, queues can be managed, and accounting information can be viewed and saved in Excel and XML formats. This is particularly useful if users are submitting print jobs under different project codes. The DesignJet 4500 also includes a 40GB hard drive so jobs can be stored up and reprinted at a later date if required.

Unattended operation

The new DesignJet 4500 includes several features that are designed to make true unattended printing much more realistic. For one, black ink capacity is available in the extra large cartridge size of 775ml as well as the standard 400ml (Cyan Magenta and Yellow cartridges are available in 225ml or 400ml). The machine can also hold two high capacity paper rolls up to 1067mm width and 175m in length, and includes automatic paper switching between the two. This can be different paper sizes or types.

Anyone who has experience with inkjet printers will know that the paper has a natural tendency to roll back up after printing and this can be a major problem when the machine is unattended as multiple prints can soon clog up the drop tray. This is particularly troublesome with thicker media types. HP looks to overcome this problem with an optional stacker for the DesignJet 4500 which is capable of flattening and stacking up to 200 plots. However, it does substantially increase the overall footprint of your machine.

While unattended operation is great for achieving maximum throughput, it doesn't mean you have to waste paper. If smaller drawing sizes are used, the machine can automatically queue these up and collate with others, depending on their priority of course.

Scan options

The DesignJet 4500 can also be bought with an optional scanner, which transforms it into a integrated colour copy system, or 'multi function printer'. The DesignJet 4500mfp features a touch screen, which makes it incredibly easy to scan and copy. Realtime printer, media, and queue information can seen in the scanner user interface along with copy accounting in the printer and copy job priority capability. The machine boast scan speeds of 3 inches per second in colour and 10 inches per second in black and white.

Conclusion

The new DesignJet 4500 series is transforming the role of the wide format inkjet printer by only taking it to new levels of performance (both in terms of raw print speed and processing), but bringing an impressive suite of remote management tools to the table. It's a workhorse system designed to deliver serious throughput, and with the optional stacker offers true unattended operation, commonly only seen with LED technology-based systems.

The DesignJet 4500mfp brings integrated scan/print/copy functionality to the table and unlike the many LED systems which have flourished in this role, offers full colour, which is increasingly becoming a valuable asset in many areas of the construction sector.



The DesignJet 4500 features two rolls for improved unattended operation

www.hp.com/designjet
www.repropoint.com

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